# Intensive numerical tests with LANCELOT (Release A): the complete results

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**Abstract.** This report contains the detailed results of the numerical experiments on the LANCELOT package for nonlinear optimization (Release A). These results constitute the basis on the discussion and analysis presented by the authors in [3].

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# 1 Introduction

LANCELOT (Release A) [2] is a package for the solution of nonlinear optimization problem of the form

$$\min_{x \in \Re^n} f(x) \tag{1}$$

subject to the constraints

$$c_e(x) = 0, \quad c_i(x) \geq 0, \tag{2}$$

and to the simple bounds

$$l_i \leq x_i \leq u_i, \quad (i = 1, \ldots, n), \tag{3}$$

where $f$, and $c$ are assumed to be smooth functions from $\Re^n$ into $\Re$ and from $\Re^n$ into $\Re^m$ respectively. *The package is specially intended for problems where $n$ and/or $m$ are large.*

The performance of the package on a set of 943 test problems extracted from the CUTE collection (see [1]) is discussed in detail by the authors in [3], but the detailed results of the many runs involved are not listed in this paper. It is the purpose of the present report to provide, for future reference, the complete set of results on which this discussion is based. The reader is referred to [3] for the definitions of the concepts and algorithms themselves.

The report mainly consists of tables. The first tables (in Section 2) present the problems selected from the CUTE collection with their characteristics. The next set of tables (in Section 3) reports the number of minor iterations required for convergence for each problem and each of the twenty one algorithmic variants tested. Section 4 contains the number of gradients evaluations for each problem and variant, while Section 5 reports the cumulative numbers of cg-iterations. Section 6 finally lists the cpu-times corresponding to all runs.

# 2 The test problem characteristics

In the tables of this section, we use the following conventions:

- $n$ is the number of problem variables,
- $m$ is the number of general constraints (i.e. constraints of the type 2) present in the problem,
- "pbid" is the number of the considered problem within the CUTE collection,
- $n_{fr}$ is the number of free variables in the problem,
- $n_{fx}$ is the number of fixed variables in the problem,
- $n_l$ is the number of variables of the problem that have lower bounds only,
- $n_u$ is the number of variables of the problem that have upper bounds only,
- $n_{lu}$ is the number of variables of the problem that have both lower and upper bounds,
- $n_{lo}$ is the number of linear groups within the objective function,
- $n_{no}$ is the number of nonlinear groups within the objective function,
- $n_{le}$ is the number of linear equality constraints,
- $n_{ne}$ is the number of nonlinear equality constraints,
- $n_{li}$ is the number of linear inequality constraints,

- $n_{ni}$ is the number of nonlinear inequality constraints,
- "best value" is the lowest value of the objective obtained for a stationary point of the corresponding problem, the minimum being taken on all successful runs.

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| AGG | 163 | 488 | C317 | 0 | 0 | 163 | 0 | 0 | 1 | 0 | 36 | 0 | 452 | 0 | 0.1000000D+26 |
| AIRCRFTA | 8 | 5 | U1 | 5 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0.3723700D-27 |
| AIRCRFTB | 8 | 0 | U2 | 5 | 3 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.6707000D-22 |
| ALJAZZAF | 3 | 1 | C1 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0.7500500D+02 |
| ARGAUSS | 3 | 0 | U3 | 3 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0.1127900D-07 |
| ARGLINA | 10 | 0 | U4 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| ARGLINA | 100 | 0 | U5 | 100 | 0 | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0.1000000D+03 |
| ARGLINB | 10 | 0 | U6 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.4634100D+01 |
| ARGLINB | 50 | 0 | U7 | 50 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.2462700D+02 |
| ARGLINB | 100 | 0 | U8 | 100 | 0 | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0.4962600D+02 |
| ARGLINC | 10 | 0 | U9 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.6135100D+01 |
| ARGLINC | 50 | 0 | U10 | 50 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.2612700D+02 |
| ARGLINC | 100 | 0 | U11 | 100 | 0 | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0.5112600D+02 |
| ARGTRIG | 10 | 0 | U12 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.3664700D-22 |
| ARGTRIG | 50 | 0 | U13 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.2292900D-19 |
| ARGTRIG | 100 | 0 | U14 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.3228900D-20 |
| ARTIF | 12 | 0 | U15 | 10 | 2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.5692600D-20 |
| ARTIF | 52 | 0 | U16 | 50 | 2 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.2685300D-23 |
| ARTIF | 102 | 0 | U17 | 100 | 2 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1958200D-21 |
| ARTIF | 502 | 0 | U18 | 500 | 2 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.2257500D-20 |
| ARTIF | 1002 | 0 | U19 | 1000 | 2 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.2564700D-19 |
| ARTIF | 5002 | 0 | U20 | 5000 | 2 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.5259700D-19 |
| ARWHEAD | 100 | 0 | U21 | 100 | 0 | 0 | 0 | 0 | 99 | 99 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| ARWHEAD | 500 | 0 | U22 | 500 | 0 | 0 | 0 | 0 | 499 | 499 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| ARWHEAD | 1000 | 0 | U23 | 1000 | 0 | 0 | 0 | 0 | 999 | 999 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| ARWHEAD | 5000 | 0 | U24 | 5000 | 0 | 0 | 0 | 0 | 4999 | 4999 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| BARD | 3 | 0 | U25 | 3 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0.8214900D-02 |
| BDEXP | 100 | 0 | U26 | 0 | 0 | 100 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.1142700D-04 |
| BDEXP | 500 | 0 | U27 | 0 | 0 | 500 | 0 | 0 | 0 | 498 | 0 | 0 | 0 | 0 | 0.5640500D-04 |
| BDEXP | 1000 | 0 | U28 | 0 | 0 | 1000 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0.1126300D-03 |
| BDEXP | 5000 | 0 | U29 | 0 | 0 | 5000 | 0 | 0 | 0 | 4998 | 0 | 0 | 0 | 0 | 0.5624000D-03 |
| BDQRTIC | 100 | 0 | U30 | 100 | 0 | 0 | 0 | 0 | 0 | 192 | 0 | 0 | 0 | 0 | 0.3787700D+03 |
| BDQRTIC | 500 | 0 | U31 | 500 | 0 | 0 | 0 | 0 | 0 | 992 | 0 | 0 | 0 | 0 | 0.1981000D+04 |
| BDQRTIC | 1000 | 0 | U32 | 1000 | 0 | 0 | 0 | 0 | 0 | 1992 | 0 | 0 | 0 | 0 | 0.3983800D+04 |
| BDVALUE | 12 | 0 | U33 | 10 | 2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.2023700D-14 |
| BDVALUE | 52 | 0 | U34 | 50 | 2 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.8532500D-10 |
| BDVALUE | 102 | 0 | U35 | 100 | 2 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1119700D-09 |
| BDVALUE | 502 | 0 | U36 | 500 | 2 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.1000600D-11 |
| BDVALUE | 1002 | 0 | U37 | 1000 | 2 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.1292700D-08 |
| BDVALUE | 5002 | 0 | U38 | 5000 | 2 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.1039600D-10 |
| BEALE | 2 | 0 | U39 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.4472500D-17 |
| BIGBANK | 2230 | 1112 | C2 | 0 | 308 | 0 | 0 | 1922 | 0 | 1 | 1112 | 0 | 0 | 0 | -0.4205700D+07 |
| BIGGS3 | 6 | 0 | U40 | 3 | 3 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0.4426500D-16 |
| BIGGS5 | 6 | 0 | U41 | 5 | 1 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0.1095800D-14 |
| BIGGS6 | 6 | 0 | U42 | 6 | 0 | 0 | 0 | 0 | 0 | 13 | 0 | 0 | 0 | 0 | 0.8906200D-12 |
| BOOTH | 2 | 0 | U43 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| BOX2 | 3 | 0 | U44 | 2 | 1 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.3261200D-17 |
| BOX3 | 3 | 0 | U45 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.2215800D-14 |
| BQPGAUSS | 2003 | 0 | U46 | 0 | 0 | 0 | 0 | 2003 | 0 | 1 | 0 | 0 | 0 | 0 | -0.3625800D+00 |
| BRATU1D | 13 | 0 | U47 | 11 | 2 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | -0.8494500D+01 |
| BRATU1D | 77 | 0 | U48 | 75 | 2 | 0 | 0 | 0 | 0 | 226 | 0 | 0 | 0 | 0 | -0.8518300D+01 |
| BRATU1D | 103 | 0 | U49 | 101 | 2 | 0 | 0 | 0 | 0 | 304 | 0 | 0 | 0 | 0 | -0.8518600D+01 |
| BRATU1D | 503 | 0 | U50 | 501 | 2 | 0 | 0 | 0 | 0 | 1504 | 0 | 0 | 0 | 0 | -0.8518900D+01 |
| BRATU1D | 1003 | 0 | U51 | 1001 | 2 | 0 | 0 | 0 | 0 | 3004 | 0 | 0 | 0 | 0 | -0.8518900D+01 |
| BRATU2D | 49 | 25 | U52 | 25 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0.7810700D-13 |
| BRATU2D | 100 | 64 | U53 | 64 | 36 | 0 | 0 | 0 | 0 | 0 | 0 | 64 | 0 | 0 | 0.4490300D-13 |
| BRATU2D | 484 | 400 | U54 | 400 | 84 | 0 | 0 | 0 | 0 | 0 | 0 | 400 | 0 | 0 | 0.3142800D-13 |
| BRATU2D | 1024 | 900 | U55 | 900 | 124 | 0 | 0 | 0 | 0 | 0 | 0 | 900 | 0 | 0 | 0.1832400D-12 |
| BRATU2D | 5184 | 4900 | U56 | 4900 | 284 | 0 | 0 | 0 | 0 | 0 | 0 | 4900 | 0 | 0 | 0.5640500D-13 |
| BRATU3D | 27 | 1 | U57 | 1 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0.4977300D-15 |
| BRATU3D | 125 | 27 | U58 | 27 | 98 | 0 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | 0 | 0.2138300D-19 |
| BRATU3D | 512 | 216 | U59 | 216 | 296 | 0 | 0 | 0 | 0 | 0 | 0 | 216 | 0 | 0 | 0.8016800D-12 |
| BRATU3D | 1000 | 512 | U60 | 512 | 488 | 0 | 0 | 0 | 0 | 0 | 0 | 512 | 0 | 0 | 0.2899600D-12 |
| BRATU3D | 4913 | 3375 | U61 | 3375 | 1538 | 0 | 0 | 0 | 0 | 0 | 0 | 3375 | 0 | 0 | 0.5535500D-10 |
| BRIDGEND | 2734 | 2727 | C168 | 1423 | 0 | 1297 | 0 | 14 | 1 | 0 | 1304 | 1423 | 0 | 0 | 0.5380800D+02 |

Problem characteristics ( 1 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| BRITGAS | 450 | 360 | C3 | 0 | 0 | 426 | 0 | 24 | 0 | 1 | 0 | 360 | 0 | 0 | 0.0000000D+00 |
| BRKMCC | 2 | 0 | U62 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1690400D+00 |
| BROWNAL | 10 | 0 | U63 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.7984600D-13 |
| BROWNAL | 50 | 0 | U64 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.1431400D-20 |
| BROWNBS | 2 | 0 | U65 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| BROWNDEN | 4 | 0 | U66 | 4 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.8582200D+05 |
| BROYDN3D | 10 | 0 | U67 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.1645500D-24 |
| BROYDN3D | 50 | 0 | U68 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.1647300D-24 |
| BROYDN3D | 100 | 0 | U69 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1648800D-24 |
| BROYDN3D | 500 | 0 | U70 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.3095900D-16 |
| BROYDN3D | 1000 | 0 | U71 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.3096000D-16 |
| BROYDN3D | 5000 | 0 | U72 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.6609800D-22 |
| BROYDN3D | 10000 | 0 | U73 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.3096400D-16 |
| BROYDN7D | 10 | 0 | U74 | 10 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0.1261100D+01 |
| BROYDN7D | 50 | 0 | U75 | 50 | 0 | 0 | 0 | 0 | 0 | 75 | 0 | 0 | 0 | 0 | 0.1324200D+02 |
| BROYDN7D | 100 | 0 | U76 | 100 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0.1330000D+02 |
| BROYDN7D | 500 | 0 | U77 | 500 | 0 | 0 | 0 | 0 | 0 | 750 | 0 | 0 | 0 | 0 | 0.1925900D+02 |
| BROYDN7D | 1000 | 0 | U78 | 1000 | 0 | 0 | 0 | 0 | 0 | 1500 | 0 | 0 | 0 | 0 | 0.1713700D+02 |
| BROYDNBD | 10 | 10 | U79 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0.1748500D-20 |
| BROYDNBD | 50 | 50 | U80 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0.1994500D-16 |
| BROYDNBD | 100 | 100 | U81 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0.9415400D-21 |
| BROYDNBD | 500 | 500 | U82 | 500 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0.2415400D-18 |
| BROYDNBD | 1000 | 1000 | U83 | 1000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0.7062900D-26 |
| BROYDNBD | 5000 | 5000 | U84 | 5000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0.5697200D-26 |
| CBRATU2D | 32 | 8 | U85 | 8 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0.2750200D-16 |
| CBRATU2D | 98 | 50 | U86 | 50 | 48 | 0 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0.1708600D-17 |
| CBRATU2D | 512 | 392 | U87 | 392 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 392 | 0 | 0 | 0.8798900D-12 |
| CBRATU2D | 1058 | 882 | U88 | 882 | 176 | 0 | 0 | 0 | 0 | 0 | 0 | 882 | 0 | 0 | 0.2810700D-12 |
| CBRATU3D | 54 | 2 | U89 | 2 | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.4977300D-15 |
| CBRATU3D | 128 | 16 | U90 | 16 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0.1223800D-19 |
| CBRATU3D | 686 | 250 | U91 | 250 | 436 | 0 | 0 | 0 | 0 | 0 | 0 | 250 | 0 | 0 | 0.1057500D-19 |
| CBRATU3D | 2000 | 1024 | U92 | 1024 | 976 | 0 | 0 | 0 | 0 | 0 | 0 | 1024 | 0 | 0 | 0.2360200D-12 |
| CHANDHEQ | 10 | 0 | U93 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.1348800D-08 |
| CHANDHEQ | 50 | 0 | U94 | 0 | 0 | 50 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.6997400D-08 |
| CHANDHEQ | 100 | 0 | U95 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1481800D-07 |
| CHEBYQAD | 2 | 0 | U96 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0.6300600D-20 |
| CHEBYQAD | 4 | 0 | U97 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0.6410600D-19 |
| CHEBYQAD | 5 | 0 | U98 | 0 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0.7549600D-31 |
| CHEBYQAD | 6 | 0 | U99 | 0 | 0 | 0 | 0 | 6 | 0 | 6 | 0 | 0 | 0 | 0 | 0.1569900D-17 |
| CHEBYQAD | 7 | 0 | U100 | 0 | 0 | 0 | 0 | 7 | 0 | 7 | 0 | 0 | 0 | 0 | 0.1157600D-24 |
| CHEBYQAD | 8 | 0 | U101 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 0 | 0.3516900D-02 |
| CHEBYQAD | 9 | 0 | U102 | 0 | 0 | 0 | 0 | 9 | 0 | 9 | 0 | 0 | 0 | 0 | 0.2234300D-29 |
| CHEBYQAD | 10 | 0 | U103 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | 0.4772700D-02 |
| CHEBYQAD | 20 | 0 | U104 | 0 | 0 | 0 | 0 | 20 | 0 | 20 | 0 | 0 | 0 | 0 | 0.4573000D-02 |
| CHEBYQAD | 50 | 0 | U105 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 0 | 0 | 0 | 0 | 0.5386300D-02 |
| CHEMRCTA | 10 | 10 | U106 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 0 | 0.3758200D-29 |
| CHEMRCTA | 50 | 50 | U107 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 4 | 46 | 0 | 0 | 0.1977300D-26 |
| CHEMRCTA | 100 | 100 | U108 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 4 | 96 | 0 | 0 | 0.3980300D-24 |
| CHEMRCTA | 500 | 500 | U109 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 4 | 496 | 0 | 0 | 0.3335900D-22 |
| CHEMRCTA | 1000 | 1000 | U110 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 4 | 996 | 0 | 0 | 0.1101700D-18 |
| CHEMRCTA | 5000 | 5000 | U111 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 4 | 4996 | 0 | 0 | 0.1000000D+26 |
| CHEMRCTB | 10 | 10 | U112 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 0.1262300D-28 |
| CHEMRCTB | 50 | 50 | U113 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 2 | 48 | 0 | 0 | 0.8993800D-26 |
| CHEMRCTB | 100 | 100 | U114 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 2 | 98 | 0 | 0 | 0.5397800D-26 |
| CHEMRCTB | 500 | 500 | U115 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 2 | 498 | 0 | 0 | 0.5520300D-23 |
| CHEMRCTB | 1000 | 1000 | U116 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 2 | 998 | 0 | 0 | 0.4603200D-19 |
| CHNROSNB | 10 | 0 | U117 | 10 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0.3993000D-21 |
| CHNROSNB | 25 | 0 | U118 | 25 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0.2055100D-20 |
| CHNROSNB | 50 | 0 | U119 | 50 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.2103600D-22 |
| CLIFF | 2 | 0 | U120 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0.1997900D+00 |
| CLPLATEA | 16 | 0 | U121 | 12 | 4 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0 | -0.6595500D-02 |
| CLPLATEA | 49 | 0 | U122 | 42 | 7 | 0 | 0 | 0 | 1 | 144 | 0 | 0 | 0 | 0 | -0.8200700D-02 |
| CLPLATEA | 100 | 0 | U123 | 90 | 10 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0 | -0.9145200D-02 |
| CLPLATEA | 529 | 0 | U124 | 506 | 23 | 0 | 0 | 0 | 1 | 1936 | 0 | 0 | 0 | 0 | -0.1097400D-01 |
| CLPLATEA | 1024 | 0 | U125 | 992 | 32 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0 | -0.1154300D-01 |

Problem characteristics ( 2 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| CLPLATEA | 5041 | 0 | U126 | 4970 | 71 | 0 | 0 | 0 | 1 | 19600 | 0 | 0 | 0 | 0 | -0.1259200D-01 |
| CLPLATEB | 16 | 0 | U127 | 12 | 4 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0 | -0.9370500D-02 |
| CLPLATEB | 49 | 0 | U128 | 42 | 7 | 0 | 0 | 0 | 1 | 144 | 0 | 0 | 0 | 0 | -0.6919400D-02 |
| CLPLATEB | 100 | 0 | U129 | 90 | 10 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0 | -0.6200800D-02 |
| CLPLATEB | 529 | 0 | U130 | 506 | 23 | 0 | 0 | 0 | 1 | 1936 | 0 | 0 | 0 | 0 | -0.5427500D-02 |
| CLPLATEB | 1024 | 0 | U131 | 992 | 32 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0 | -0.5283500D-02 |
| CLPLATEB | 5041 | 0 | U132 | 4970 | 71 | 0 | 0 | 0 | 1 | 19600 | 0 | 0 | 0 | 0 | -0.5094800D-02 |
| CLPLATEC | 16 | 0 | U133 | 12 | 4 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0 | -0.5147600D-02 |
| CLPLATEC | 49 | 0 | U134 | 42 | 7 | 0 | 0 | 0 | 1 | 144 | 0 | 0 | 0 | 0 | -0.5139900D-02 |
| CLPLATEC | 100 | 0 | U135 | 90 | 10 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0 | -0.5114100D-02 |
| CLPLATEC | 529 | 0 | U136 | 506 | 23 | 0 | 0 | 0 | 1 | 1936 | 0 | 0 | 0 | 0 | -0.5059000D-02 |
| CLPLATEC | 1024 | 0 | U137 | 992 | 32 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0 | -0.5043900D-02 |
| CLPLATEC | 5041 | 0 | U138 | 4970 | 71 | 0 | 0 | 0 | 1 | 19600 | 0 | 0 | 0 | 0 | -0.5020700D-02 |
| CLUSTER | 2 | 2 | U139 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0.1033600D-11 |
| CORKSCRW | 96 | 70 | C298 | 47 | 9 | 0 | 0 | 40 | 0 | 10 | 60 | 0 | 0 | 10 | 0.1160100D+01 |
| CORKSCRW | 456 | 350 | C299 | 247 | 9 | 0 | 0 | 200 | 0 | 50 | 300 | 0 | 0 | 50 | 0.2648400D+02 |
| CORKSCRW | 906 | 700 | C300 | 497 | 9 | 0 | 0 | 400 | 0 | 100 | 600 | 0 | 0 | 100 | 0.4436800D+02 |
| CORKSCRW | 4506 | 3500 | C301 | 2497 | 9 | 0 | 0 | 2000 | 0 | 500 | 3000 | 0 | 0 | 500 | 0.1000000D+26 |
| CORKSCRW | 9006 | 7000 | C302 | 4997 | 9 | 0 | 0 | 4000 | 0 | 1000 | 6000 | 0 | 0 | 1000 | 0.1000000D+26 |
| CRAGGLVY | 4 | 0 | U140 | 4 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.7035800D-08 |
| CRAGGLVY | 10 | 0 | U141 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.1886600D+01 |
| CRAGGLVY | 50 | 0 | U142 | 50 | 0 | 0 | 0 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0.1537300D+02 |
| CRAGGLVY | 100 | 0 | U143 | 100 | 0 | 0 | 0 | 0 | 0 | 245 | 0 | 0 | 0 | 0 | 0.3227000D+02 |
| CRAGGLVY | 500 | 0 | U144 | 500 | 0 | 0 | 0 | 0 | 0 | 1245 | 0 | 0 | 0 | 0 | 0.1674500D+03 |
| CRAGGLVY | 1000 | 0 | U145 | 1000 | 0 | 0 | 0 | 0 | 0 | 2495 | 0 | 0 | 0 | 0 | 0.3364200D+03 |
| CRAGGLVY | 5000 | 0 | U146 | 5000 | 0 | 0 | 0 | 0 | 0 | 12495 | 0 | 0 | 0 | 0 | 0.1688200D+04 |
| CUBE | 2 | 0 | U147 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.7431600D-16 |
| DALLASL | 906 | 667 | C4 | 0 | 0 | 0 | 0 | 906 | 0 | 1 | 667 | 0 | 0 | 0 | -0.2026000D+06 |
| DALLASM | 196 | 151 | C5 | 0 | 0 | 0 | 0 | 196 | 0 | 1 | 151 | 0 | 0 | 0 | -0.4819800D+05 |
| DALLASS | 46 | 31 | C6 | 0 | 0 | 0 | 0 | 46 | 0 | 1 | 31 | 0 | 0 | 0 | -0.3239300D+05 |
| DEGENLPA | 20 | 15 | C7 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 15 | 0 | 0 | 0 | 0.3060400D+01 |
| DEGENLPB | 20 | 15 | C8 | 0 | 0 | 0 | 0 | 20 | 1 | 0 | 15 | 0 | 0 | 0 | -0.3073100D+02 |
| DENSCHNA | 2 | 0 | U281 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.3781800D-15 |
| DENSCHNB | 2 | 0 | U282 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DENSCHNC | 2 | 0 | U283 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.1019700D-18 |
| DENSCHND | 3 | 0 | U284 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.1981100D-09 |
| DENSCHNE | 3 | 0 | U285 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.3798400D-19 |
| DENSCHNF | 2 | 0 | U286 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.8775000D-22 |
| DIPIGRI | 7 | 4 | C9 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0.6806300D+03 |
| DISC2 | 29 | 23 | C324 | 22 | 0 | 0 | 0 | 7 | 1 | 0 | 0 | 17 | 0 | 6 | 0.1562500D+01 |
| DISCS | 36 | 66 | C316 | 21 | 3 | 12 | 0 | 0 | 1 | 0 | 0 | 18 | 0 | 48 | 0.1200000D+02 |
| DIXCHLNG | 10 | 5 | C180 | 10 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 5 | 0 | 0 | 0.1757800D-12 |
| DIXCHLNV | 10 | 5 | C181 | 0 | 0 | 10 | 0 | 0 | 0 | 49 | 0 | 5 | 0 | 0 | 0.1072600D-13 |
| DIXMAANA | 15 | 0 | U148 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANA | 90 | 0 | U149 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANA | 300 | 0 | U150 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANA | 1500 | 0 | U151 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANA | 3000 | 0 | U152 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANB | 15 | 0 | U153 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANB | 90 | 0 | U154 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANB | 300 | 0 | U155 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANB | 1500 | 0 | U156 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANB | 3000 | 0 | U157 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANC | 15 | 0 | U158 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANC | 90 | 0 | U159 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANC | 300 | 0 | U160 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANC | 1500 | 0 | U161 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANC | 3000 | 0 | U162 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAAND | 15 | 0 | U163 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAAND | 90 | 0 | U164 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAAND | 300 | 0 | U165 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAAND | 1500 | 0 | U166 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAAND | 3000 | 0 | U167 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANE | 15 | 0 | U168 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANE | 90 | 0 | U169 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |

Problem characteristics ( 3 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| DIXMAANE | 300 | 0 | U170 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANE | 1500 | 0 | U171 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANE | 3000 | 0 | U172 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANF | 15 | 0 | U173 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANF | 90 | 0 | U174 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANF | 300 | 0 | U175 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANF | 1500 | 0 | U176 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANF | 3000 | 0 | U177 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANG | 15 | 0 | U178 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANG | 90 | 0 | U179 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANG | 300 | 0 | U180 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANG | 1500 | 0 | U181 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANG | 3000 | 0 | U182 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANH | 15 | 0 | U183 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANH | 90 | 0 | U184 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANH | 300 | 0 | U185 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANH | 1500 | 0 | U186 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANH | 3000 | 0 | U187 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANI | 15 | 0 | U188 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANI | 90 | 0 | U189 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANI | 300 | 0 | U190 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANI | 1500 | 0 | U191 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANI | 3000 | 0 | U192 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANJ | 15 | 0 | U193 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANJ | 90 | 0 | U194 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANJ | 300 | 0 | U195 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANJ | 1500 | 0 | U196 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANJ | 3000 | 0 | U197 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANK | 15 | 0 | U198 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANK | 90 | 0 | U199 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANK | 300 | 0 | U200 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANK | 1500 | 0 | U201 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANK | 3000 | 0 | U202 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANL | 15 | 0 | U203 | 15 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANL | 90 | 0 | U204 | 90 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANL | 300 | 0 | U205 | 300 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANL | 1500 | 0 | U206 | 1500 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXMAANL | 3000 | 0 | U207 | 3000 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| DIXON3DQ | 10 | 0 | U208 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DIXON3DQ | 50 | 0 | U209 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DIXON3DQ | 100 | 0 | U210 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DIXON3DQ | 500 | 0 | U211 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DIXON3DQ | 1000 | 0 | U212 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DIXON3DQ | 5000 | 0 | U213 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DQDRTIC | 10 | 0 | U214 | 10 | 0 | 0 | 0 | 0 | 0 | 24 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DQDRTIC | 50 | 0 | U215 | 50 | 0 | 0 | 0 | 0 | 0 | 144 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DQDRTIC | 100 | 0 | U216 | 100 | 0 | 0 | 0 | 0 | 0 | 294 | 0 | 0 | 0 | 0 | 0.7868200D-42 |
| DQDRTIC | 500 | 0 | U217 | 500 | 0 | 0 | 0 | 0 | 0 | 1494 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| DQDRTIC | 1000 | 0 | U218 | 1000 | 0 | 0 | 0 | 0 | 0 | 2994 | 0 | 0 | 0 | 0 | 0.4942700D-38 |
| DQDRTIC | 5000 | 0 | U219 | 5000 | 0 | 0 | 0 | 0 | 0 | 14994 | 0 | 0 | 0 | 0 | 0.1079800D-47 |
| DQRTIC | 10 | 0 | U220 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.7130800D-08 |
| DQRTIC | 50 | 0 | U221 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.1932300D-07 |
| DQRTIC | 100 | 0 | U222 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.5044400D-08 |
| DQRTIC | 500 | 0 | U223 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.3595100D-07 |
| DQRTIC | 1000 | 0 | U224 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.8910200D-08 |
| DQRTIC | 5000 | 0 | U225 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.1300300D-09 |
| EDENSCH | 36 | 0 | U226 | 36 | 0 | 0 | 0 | 0 | 0 | 106 | 0 | 0 | 0 | 0 | 0.2192800D+03 |
| EDENSCH | 2000 | 0 | U227 | 2000 | 0 | 0 | 0 | 0 | 0 | 5998 | 0 | 0 | 0 | 0 | 0.1200300D+05 |
| ENGVAL1 | 2 | 0 | U228 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| ENGVAL1 | 50 | 0 | U229 | 50 | 0 | 0 | 0 | 0 | 49 | 49 | 0 | 0 | 0 | 0 | 0.5358200D+02 |
| ENGVAL1 | 100 | 0 | U230 | 100 | 0 | 0 | 0 | 0 | 99 | 99 | 0 | 0 | 0 | 0 | 0.1090900D+03 |
| ENGVAL1 | 1000 | 0 | U231 | 1000 | 0 | 0 | 0 | 0 | 999 | 999 | 0 | 0 | 0 | 0 | 0.1108200D+04 |
| ENGVAL1 | 5000 | 0 | U232 | 5000 | 0 | 0 | 0 | 0 | 4999 | 4999 | 0 | 0 | 0 | 0 | 0.5548700D+04 |
| ENGVAL2 | 3 | 0 | U233 | 3 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.1005900D-22 |
| ERRINBAR | 18 | 9 | C10 | 4 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 8 | 1 | 0 | 0.1000000D+26 |

Problem characteristics ( 4 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| ERRINROS | 10 | 0 | U234 | 10 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0.6694600D+01 |
| ERRINROS | 25 | 0 | U235 | 25 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0.1846100D+02 |
| ERRINROS | 50 | 0 | U236 | 50 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.3990400D+02 |
| EXPFIT | 2 | 0 | U289 | 2 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.2405100D+00 |
| EXPFITA | 5 | 22 | C11 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 22 | 0 | 0.1136600D-02 |
| EXPFITB | 5 | 102 | C12 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 102 | 0 | 0.5019300D-02 |
| EXPFITC | 5 | 502 | C13 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 502 | 0 | 0.2330200D-01 |
| EXTROSNB | 5 | 0 | U237 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.3110000D-17 |
| EXTROSNB | 10 | 0 | U238 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.6357200D-12 |
| FREUROTH | 2 | 0 | U239 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.4898400D+02 |
| FREUROTH | 10 | 0 | U240 | 10 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0.1014100D+04 |
| FREUROTH | 50 | 0 | U241 | 50 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.5881000D+04 |
| FREUROTH | 100 | 0 | U242 | 100 | 0 | 0 | 0 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0.1196500D+05 |
| FREUROTH | 500 | 0 | U243 | 500 | 0 | 0 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0.6063400D+05 |
| FREUROTH | 1000 | 0 | U244 | 1000 | 0 | 0 | 0 | 0 | 0 | 1998 | 0 | 0 | 0 | 0 | 0.1214700D+06 |
| FREUROTH | 5000 | 0 | U245 | 5000 | 0 | 0 | 0 | 0 | 0 | 9998 | 0 | 0 | 0 | 0 | 0.6081600D+06 |
| GAUSSELM | 14 | 11 | C14 | 3 | 1 | 2 | 0 | 8 | 1 | 0 | 0 | 5 | 6 | 0 | -0.2250000D+01 |
| GAUSSELM | 506 | 1135 | C15 | 375 | 1 | 10 | 0 | 120 | 1 | 0 | 0 | 385 | 750 | 0 | -0.1069600D+02 |
| GAUSSELM | 650 | 1496 | C16 | 495 | 1 | 11 | 0 | 143 | 1 | 0 | 0 | 506 | 990 | 0 | -0.1196100D+02 |
| GOTTFR | 2 | 0 | U246 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.2849100D-14 |
| GRIDNETA | 60 | 36 | C20 | 26 | 14 | 16 | 0 | 4 | 0 | 1 | 36 | 0 | 0 | 0 | 0.7170900D+02 |
| GRIDNETA | 180 | 100 | C21 | 95 | 48 | 33 | 0 | 4 | 0 | 1 | 100 | 0 | 0 | 0 | 0.9524200D+02 |
| GRIDNETA | 612 | 324 | C22 | 361 | 182 | 65 | 0 | 4 | 0 | 1 | 324 | 0 | 0 | 0 | 0.1021200D+03 |
| GRIDNETA | 924 | 484 | C23 | 559 | 280 | 81 | 0 | 4 | 0 | 1 | 484 | 0 | 0 | 0 | 0.1347300D+03 |
| GRIDNETA | 3444 | 1764 | C24 | 2185 | 1094 | 161 | 0 | 4 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.1616100D+03 |
| GRIDNETA | 7564 | 3844 | C25 | 4899 | 2420 | 241 | 0 | 4 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.4779200D+03 |
| GRIDNETA | 13284 | 6724 | C26 | 8639 | 4320 | 321 | 0 | 4 | 0 | 1 | 6724 | 0 | 0 | 0 | 0.3049800D+03 |
| GRIDNETB | 60 | 36 | C27 | 60 | 0 | 0 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.3799700D+02 |
| GRIDNETB | 180 | 100 | C28 | 180 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0.4726800D+02 |
| GRIDNETB | 612 | 324 | C29 | 612 | 0 | 0 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0.6735700D+02 |
| GRIDNETB | 924 | 484 | C30 | 924 | 0 | 0 | 0 | 0 | 0 | 1 | 484 | 0 | 0 | 0 | 0.7575800D+02 |
| GRIDNETB | 3444 | 1764 | C31 | 3444 | 0 | 0 | 0 | 0 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.1067500D+03 |
| GRIDNETB | 7564 | 3844 | C32 | 7564 | 0 | 0 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.1276100D+03 |
| GRIDNETB | 13284 | 6724 | C33 | 13284 | 0 | 0 | 0 | 0 | 0 | 1 | 6724 | 0 | 0 | 0 | 0.1433000D+03 |
| GRIDNETC | 60 | 36 | C34 | 40 | 0 | 20 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.3864100D+02 |
| GRIDNETC | 180 | 100 | C35 | 120 | 0 | 60 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0.4835200D+02 |
| GRIDNETC | 612 | 324 | C36 | 408 | 0 | 204 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0.6794600D+02 |
| GRIDNETC | 924 | 484 | C37 | 616 | 0 | 308 | 0 | 0 | 0 | 1 | 484 | 0 | 0 | 0 | 0.7642600D+02 |
| GRIDNETC | 3444 | 1764 | C38 | 2296 | 0 | 1148 | 0 | 0 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.1080100D+03 |
| GRIDNETC | 7564 | 3844 | C39 | 5043 | 0 | 2521 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.1618700D+03 |
| GRIDNETD | 60 | 36 | C40 | 26 | 14 | 16 | 0 | 4 | 0 | 1 | 36 | 0 | 0 | 0 | 0.7344900D+02 |
| GRIDNETD | 180 | 100 | C41 | 95 | 48 | 33 | 0 | 4 | 0 | 1 | 100 | 0 | 0 | 0 | 0.9924800D+02 |
| GRIDNETD | 612 | 324 | C42 | 361 | 182 | 65 | 0 | 4 | 0 | 1 | 324 | 0 | 0 | 0 | 0.1116500D+03 |
| GRIDNETD | 924 | 484 | C43 | 559 | 280 | 81 | 0 | 4 | 0 | 1 | 484 | 0 | 0 | 0 | 0.1481500D+03 |
| GRIDNETD | 3444 | 1764 | C44 | 2185 | 1094 | 161 | 0 | 4 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.2015200D+03 |
| GRIDNETD | 7564 | 3844 | C45 | 4899 | 2420 | 241 | 0 | 4 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.5706500D+03 |
| GRIDNETE | 60 | 36 | C46 | 60 | 0 | 0 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.3960500D+02 |
| GRIDNETE | 180 | 100 | C47 | 180 | 0 | 0 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0.5060000D+02 |
| GRIDNETE | 612 | 324 | C48 | 612 | 0 | 0 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0.7555100D+02 |
| GRIDNETE | 924 | 484 | C49 | 924 | 0 | 0 | 0 | 0 | 0 | 1 | 484 | 0 | 0 | 0 | 0.8725900D+02 |
| GRIDNETE | 3444 | 1764 | C50 | 3444 | 0 | 0 | 0 | 0 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.1440600D+03 |
| GRIDNETE | 7564 | 3844 | C51 | 7564 | 0 | 0 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.2064800D+03 |
| GRIDNETF | 60 | 36 | C52 | 40 | 0 | 20 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.4021300D+02 |
| GRIDNETF | 180 | 100 | C53 | 120 | 0 | 60 | 0 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0.5164800D+02 |
| GRIDNETF | 612 | 324 | C54 | 408 | 0 | 204 | 0 | 0 | 0 | 1 | 324 | 0 | 0 | 0 | 0.7607900D+02 |
| GRIDNETF | 924 | 484 | C55 | 616 | 0 | 308 | 0 | 0 | 0 | 1 | 484 | 0 | 0 | 0 | 0.8786000D+02 |
| GRIDNETF | 3444 | 1764 | C56 | 2296 | 0 | 1148 | 0 | 0 | 0 | 1 | 1764 | 0 | 0 | 0 | 0.1452500D+03 |
| GRIDNETF | 7564 | 3844 | C57 | 5043 | 0 | 2521 | 0 | 0 | 0 | 1 | 3844 | 0 | 0 | 0 | 0.2435400D+03 |
| GRIDNETG | 60 | 36 | C58 | 26 | 14 | 16 | 0 | 4 | 0 | 1 | 36 | 0 | 0 | 0 | 0.7344900D+02 |
| GRIDNETH | 60 | 36 | C59 | 60 | 0 | 0 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.3960900D+02 |
| GRIDNETI | 60 | 36 | C60 | 40 | 0 | 20 | 0 | 0 | 0 | 1 | 36 | 0 | 0 | 0 | 0.4022300D+02 |
| GULF | 3 | 0 | U247 | 3 | 0 | 0 | 0 | 0 | 0 | 99 | 0 | 0 | 0 | 0 | 0.4394500D-26 |
| HAGER1 | 21 | 10 | C270 | 20 | 1 | 0 | 0 | 0 | 0 | 11 | 10 | 0 | 0 | 0 | 0.8809700D+00 |
| HAGER1 | 101 | 50 | C271 | 100 | 1 | 0 | 0 | 0 | 0 | 51 | 50 | 0 | 0 | 0 | 0.8808000D+00 |
| HAGER1 | 201 | 100 | C272 | 200 | 1 | 0 | 0 | 0 | 0 | 101 | 100 | 0 | 0 | 0 | 0.8808000D+00 |

Problem characteristics ( 5 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| HAGER1 | 1001 | 500 | C273 | 1000 | 1 | 0 | 0 | 0 | 0 | 501 | 500 | 0 | 0 | 0 | 0.8808000D+00 |
| HAGER1 | 2001 | 1000 | C274 | 2000 | 1 | 0 | 0 | 0 | 0 | 1001 | 1000 | 0 | 0 | 0 | 0.8808000D+00 |
| HAGER1 | 10001 | 5000 | C275 | 10000 | 1 | 0 | 0 | 0 | 0 | 5001 | 5000 | 0 | 0 | 0 | 0.8808000D+00 |
| HAGER2 | 21 | 10 | C276 | 20 | 1 | 0 | 0 | 0 | 0 | 20 | 10 | 0 | 0 | 0 | 0.4325700D+00 |
| HAGER2 | 101 | 50 | C277 | 100 | 1 | 0 | 0 | 0 | 0 | 100 | 50 | 0 | 0 | 0 | 0.4321000D+00 |
| HAGER2 | 201 | 100 | C278 | 200 | 1 | 0 | 0 | 0 | 0 | 200 | 100 | 0 | 0 | 0 | 0.4320900D+00 |
| HAGER2 | 1001 | 500 | C279 | 1000 | 1 | 0 | 0 | 0 | 0 | 1000 | 500 | 0 | 0 | 0 | 0.4320800D+00 |
| HAGER2 | 2001 | 1000 | C280 | 2000 | 1 | 0 | 0 | 0 | 0 | 2000 | 1000 | 0 | 0 | 0 | 0.4320800D+00 |
| HAGER2 | 10001 | 5000 | C281 | 10000 | 1 | 0 | 0 | 0 | 0 | 10000 | 5000 | 0 | 0 | 0 | 0.4320800D+00 |
| HAGER3 | 21 | 10 | C282 | 20 | 1 | 0 | 0 | 0 | 0 | 20 | 10 | 0 | 0 | 0 | 0.1410300D+00 |
| HAGER3 | 101 | 50 | C283 | 100 | 1 | 0 | 0 | 0 | 0 | 100 | 50 | 0 | 0 | 0 | 0.1409600D+00 |
| HAGER3 | 201 | 100 | C284 | 200 | 1 | 0 | 0 | 0 | 0 | 200 | 100 | 0 | 0 | 0 | 0.1409600D+00 |
| HAGER3 | 1001 | 500 | C285 | 1000 | 1 | 0 | 0 | 0 | 0 | 1000 | 500 | 0 | 0 | 0 | 0.1409600D+00 |
| HAGER3 | 2001 | 1000 | C286 | 2000 | 1 | 0 | 0 | 0 | 0 | 2000 | 1000 | 0 | 0 | 0 | 0.1409600D+00 |
| HAGER3 | 10001 | 5000 | C287 | 10000 | 1 | 0 | 0 | 0 | 0 | 10000 | 5000 | 0 | 0 | 0 | 0.1409600D+00 |
| HAGER4 | 21 | 10 | C288 | 10 | 1 | 0 | 10 | 0 | 0 | 1 | 10 | 0 | 0 | 0 | 0.2833900D+01 |
| HAGER4 | 101 | 50 | C289 | 50 | 1 | 0 | 50 | 0 | 0 | 1 | 50 | 0 | 0 | 0 | 0.2799800D+01 |
| HAGER4 | 201 | 100 | C290 | 100 | 1 | 0 | 100 | 0 | 0 | 1 | 100 | 0 | 0 | 0 | 0.2796800D+01 |
| HAGER4 | 1001 | 500 | C291 | 500 | 1 | 0 | 500 | 0 | 0 | 1 | 500 | 0 | 0 | 0 | 0.2794500D+01 |
| HAGER4 | 2001 | 1000 | C292 | 1000 | 1 | 0 | 1000 | 0 | 0 | 1 | 1000 | 0 | 0 | 0 | 0.2794200D+01 |
| HAGER4 | 10001 | 5000 | C293 | 5000 | 1 | 0 | 5000 | 0 | 0 | 1 | 5000 | 0 | 0 | 0 | 0.2794000D+01 |
| HAIRY | 2 | 0 | U248 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2000000D+02 |
| HATFLDA | 4 | 0 | U249 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.2550500D-16 |
| HATFLDB | 4 | 0 | U250 | 0 | 0 | 3 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0.5572800D-02 |
| HATFLDC | 25 | 0 | U251 | 1 | 0 | 0 | 0 | 24 | 0 | 25 | 0 | 0 | 0 | 0 | 0.1317200D-16 |
| HATFLDD | 3 | 0 | U252 | 3 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.6615100D-07 |
| HATFLDE | 3 | 0 | U253 | 3 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0.5120400D-06 |
| HATFLDF | 3 | 0 | U254 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.9758500D-14 |
| HATFLDG | 25 | 0 | U255 | 25 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0.8806800D-16 |
| HATFLDH | 4 | 7 | C61 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 7 | 0 | -0.2450000D+02 |
| HELIX | 3 | 0 | U256 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.1104700D-22 |
| HILBERTA | 2 | 0 | U257 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTA | 4 | 0 | U258 | 4 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTA | 5 | 0 | U259 | 5 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTA | 6 | 0 | U260 | 6 | 0 | 0 | 0 | 0 | 0 | 21 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTA | 10 | 0 | U261 | 10 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTB | 5 | 0 | U262 | 5 | 0 | 0 | 0 | 0 | 0 | 15 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTB | 10 | 0 | U263 | 10 | 0 | 0 | 0 | 0 | 0 | 55 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HILBERTB | 50 | 0 | U264 | 50 | 0 | 0 | 0 | 0 | 0 | 1275 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HIMMELBA | 2 | 0 | U265 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HIMMELBB | 2 | 0 | U266 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4585800D-37 |
| HIMMELBC | 2 | 0 | U267 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.4565100D-25 |
| HIMMELBD | 2 | 0 | U268 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.5922600D+01 |
| HIMMELBE | 3 | 0 | U269 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.1109300D-30 |
| HIMMELBF | 4 | 0 | U270 | 4 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0.3185700D+03 |
| HIMMELBG | 2 | 0 | U271 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2379300D-17 |
| HIMMELBH | 2 | 0 | U272 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | -0.1000000D+01 |
| HIMMELBI | 100 | 12 | C263 | 0 | 0 | 0 | 0 | 100 | 0 | 20 | 0 | 0 | 12 | 0 | -0.1735600D+04 |
| HIMMELBJ | 45 | 14 | C268 | 0 | 2 | 43 | 0 | 0 | 0 | 1 | 14 | 0 | 0 | 0 | -0.1910300D+04 |
| HIMMELBK | 24 | 14 | C269 | 0 | 0 | 24 | 0 | 0 | 1 | 0 | 2 | 12 | 0 | 0 | 0.5181400D-01 |
| HONG | 4 | 1 | U445 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0.2257100D+02 |
| HS1 | 2 | 0 | U273 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.1271900D-17 |
| HS10 | 2 | 1 | C66 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | -0.1000000D+01 |
| HS100 | 7 | 4 | C150 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0.6806300D+03 |
| HS100MOD | 7 | 4 | C310 | 7 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 4 | 0.6786800D+03 |
| HS101 | 7 | 5 | C151 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 5 | 0.1809800D+04 |
| HS102 | 7 | 5 | C152 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 5 | 0.9118800D+03 |
| HS103 | 7 | 5 | C153 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 0 | 0 | 5 | 0.1000000D+26 |
| HS104 | 8 | 5 | C154 | 0 | 0 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 0 | 5 | 0.3951200D+01 |
| HS105 | 8 | 1 | C155 | 0 | 0 | 0 | 0 | 8 | 0 | 235 | 0 | 0 | 1 | 0 | 0.1044600D+04 |
| HS106 | 8 | 6 | C156 | 0 | 0 | 0 | 0 | 8 | 1 | 0 | 0 | 0 | 3 | 3 | 0.7049200D+04 |
| HS107 | 9 | 6 | C157 | 4 | 0 | 2 | 0 | 3 | 0 | 1 | 0 | 6 | 0 | 0 | 0.5055000D+04 |
| HS108 | 9 | 13 | C158 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 13 | -0.8660300D+00 |
| HS109 | 9 | 10 | C159 | 0 | 0 | 2 | 0 | 7 | 0 | 1 | 0 | 6 | 2 | 2 | 0.5362100D+04 |
| HS11 | 2 | 1 | C67 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | -0.8498500D+01 |

Problem characteristics ( 6 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| HS110 | 10 | 0 | U296 | 0 | 0 | 0 | 0 | 10 | 0 | 21 | 0 | 0 | 0 | 0 | -0.4577800D+02 |
| HS111 | 10 | 3 | C160 | 0 | 0 | 0 | 0 | 10 | 0 | 1 | 0 | 3 | 0 | 0 | -0.4776100D+02 |
| HS112 | 10 | 3 | C161 | 0 | 0 | 10 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | -0.4776100D+02 |
| HS113 | 10 | 8 | C162 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 5 | 0.2430600D+02 |
| HS114 | 10 | 11 | C163 | 0 | 0 | 0 | 0 | 10 | 0 | 1 | 1 | 2 | 4 | 4 | -0.1768800D+04 |
| HS116 | 13 | 14 | C164 | 0 | 0 | 0 | 0 | 13 | 1 | 0 | 0 | 0 | 4 | 10 | 0.1000000D+26 |
| HS117 | 15 | 5 | C165 | 0 | 0 | 15 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 5 | 0.3234900D+02 |
| HS118 | 15 | 17 | C166 | 0 | 0 | 0 | 0 | 15 | 0 | 1 | 0 | 0 | 17 | 0 | 0.6648200D+03 |
| HS119 | 16 | 8 | C167 | 0 | 0 | 0 | 0 | 16 | 0 | 16 | 8 | 0 | 0 | 0 | 0.2449000D+03 |
| HS12 | 2 | 1 | C68 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | -0.3000000D+02 |
| HS13 | 2 | 1 | C69 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.9587100D+00 |
| HS14 | 2 | 2 | C70 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.1393500D+01 |
| HS15 | 2 | 2 | C71 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0.3065000D+03 |
| HS16 | 2 | 2 | C72 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0.2500000D+00 |
| HS17 | 2 | 2 | C73 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0.9999800D+00 |
| HS18 | 2 | 2 | C74 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | 0.5000000D+01 |
| HS19 | 2 | 2 | C75 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 2 | -0.6961800D+04 |
| HS2 | 2 | 0 | U274 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.4941200D+01 |
| HS20 | 2 | 3 | C76 | 1 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 3 | 0.4019900D+02 |
| HS21 | 2 | 1 | C77 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 1 | -0.9996000D+02 |
| HS22 | 2 | 2 | C78 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 0.1000000D+01 |
| HS23 | 2 | 5 | C79 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 5 | 0.2000000D+01 |
| HS24 | 2 | 3 | C80 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | -0.1000000D+01 |
| HS25 | 3 | 0 | U278 | 0 | 0 | 0 | 0 | 3 | 0 | 99 | 0 | 0 | 0 | 0 | 0.3283500D+02 |
| HS26 | 3 | 1 | C81 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0.4453100D-11 |
| HS27 | 3 | 1 | C82 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0.4000000D-01 |
| HS28 | 3 | 1 | C83 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.2218700D-30 |
| HS29 | 3 | 1 | C84 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | -0.2262700D+02 |
| HS3 | 2 | 0 | U275 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| HS30 | 3 | 1 | C85 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1000000D+01 |
| HS31 | 3 | 1 | C86 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 1 | 0.6000000D+01 |
| HS32 | 3 | 2 | C87 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0.9999800D+00 |
| HS33 | 3 | 2 | C88 | 0 | 0 | 2 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | -0.4585800D+01 |
| HS34 | 3 | 2 | C89 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 2 | -0.8340300D+00 |
| HS35 | 3 | 1 | C90 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0.1111100D+00 |
| HS36 | 3 | 1 | C91 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 0 | -0.3300000D+04 |
| HS37 | 3 | 2 | C92 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 2 | 0 | -0.3456000D+04 |
| HS38 | 4 | 0 | U279 | 0 | 0 | 0 | 0 | 4 | 0 | 7 | 0 | 0 | 0 | 0 | 0.2713200D-18 |
| HS39 | 4 | 2 | C93 | 4 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | -0.1000000D+01 |
| HS4 | 2 | 0 | U276 | 0 | 0 | 2 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.2666700D+01 |
| HS40 | 4 | 3 | C94 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | -0.2500000D+00 |
| HS41 | 4 | 1 | C95 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 1 | 0 | 0 | 0 | 0.1925900D+01 |
| HS42 | 4 | 2 | C96 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0.1385800D+02 |
| HS43 | 4 | 3 | C97 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | -0.4400000D+02 |
| HS44 | 4 | 6 | C98 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 6 | 0 | -0.1500000D+02 |
| HS45 | 5 | 0 | U280 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| HS46 | 5 | 2 | C99 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0.9976500D-12 |
| HS47 | 5 | 3 | C100 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | -0.2671400D-01 |
| HS48 | 5 | 2 | C101 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0.9860800D-31 |
| HS49 | 5 | 2 | C102 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0.9627600D-08 |
| HS5 | 2 | 0 | U277 | 0 | 0 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | -0.1913200D+01 |
| HS50 | 5 | 3 | C103 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0.1583800D-12 |
| HS51 | 5 | 3 | C104 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0.0000000D+00 |
| HS52 | 5 | 3 | C105 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0.5326600D+01 |
| HS53 | 5 | 3 | C106 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 3 | 0 | 0 | 0 | 0.4093000D+01 |
| HS54 | 6 | 1 | C107 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 1 | 0 | 0 | 0 | -0.9080700D+00 |
| HS55 | 6 | 6 | C108 | 0 | 0 | 4 | 0 | 2 | 0 | 1 | 6 | 0 | 0 | 0 | 0.6666700D+01 |
| HS56 | 7 | 4 | C109 | 7 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | -0.3456000D+01 |
| HS57 | 2 | 1 | C110 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.2845900D-01 |
| HS59 | 2 | 3 | C111 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 3 | -0.7802800D+01 |
| HS6 | 2 | 1 | C62 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0.9115000D-20 |
| HS60 | 3 | 1 | C112 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 1 | 0 | 0 | 0.3256800D-01 |
| HS61 | 3 | 2 | C113 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | -0.1436500D+03 |
| HS62 | 3 | 1 | C114 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | -0.2627300D+05 |
| HS63 | 3 | 2 | C115 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0.9617200D+03 |

Problem characteristics ( 7 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| HS64 | 3 | 1 | C116 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.6299800D+04 |
| HS65 | 3 | 1 | C117 | 0 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 1 | 0.9535300D+00 |
| HS66 | 3 | 2 | C118 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 2 | 0.5181600D+00 |
| HS67 | 3 | 14 | C119 | 0 | 0 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 0 | 14 | -0.1162100D+04 |
| HS68 | 4 | 2 | C120 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 2 | 0 | 0 | -0.9203900D+00 |
| HS69 | 4 | 2 | C121 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 2 | 0 | 0 | -0.9567100D+03 |
| HS7 | 2 | 1 | C63 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.1732100D+01 |
| HS70 | 4 | 1 | C122 | 0 | 0 | 0 | 0 | 4 | 0 | 19 | 0 | 0 | 0 | 1 | 0.7498500D-02 |
| HS71 | 4 | 2 | C123 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 1 | 0 | 1 | 0.1701400D+02 |
| HS72 | 4 | 2 | C124 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 2 | 0.7275900D+03 |
| HS73 | 4 | 3 | C125 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0.2989400D+02 |
| HS74 | 4 | 5 | C126 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 3 | 2 | 0 | 0.5126500D+04 |
| HS75 | 4 | 5 | C127 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 3 | 2 | 0 | 0.5174400D+04 |
| HS76 | 4 | 3 | C128 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 3 | 0 | -0.4681800D+01 |
| HS77 | 5 | 2 | C129 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 2 | 0 | 0 | 0.2415100D+00 |
| HS78 | 5 | 3 | C130 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | -0.2919700D+01 |
| HS79 | 5 | 3 | C131 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0.7877600D-01 |
| HS8 | 2 | 2 | C64 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | -0.1000000D+01 |
| HS80 | 5 | 3 | C132 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 3 | 0 | 0 | 0.5395000D-01 |
| HS81 | 5 | 3 | C133 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 3 | 0 | 0 | 0.5395000D-01 |
| HS83 | 5 | 3 | C134 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 3 | -0.3066600D+05 |
| HS84 | 5 | 3 | C135 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 0 | 3 | 0.1000000D+26 |
| HS85 | 5 | 21 | C136 | 0 | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 0 | 1 | 20 | -0.2215600D+01 |
| HS86 | 5 | 10 | C137 | 0 | 0 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 10 | 0 | -0.3234900D+02 |
| HS87 | 6 | 4 | C138 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 0 | 4 | 0 | 0 | 0.8962000D+04 |
| HS88 | 2 | 1 | C139 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1360100D+01 |
| HS89 | 3 | 1 | C140 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1353100D+01 |
| HS9 | 2 | 1 | C65 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | -0.5000000D+00 |
| HS90 | 4 | 1 | C141 | 4 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1360100D+01 |
| HS91 | 5 | 1 | C142 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1360100D+01 |
| HS92 | 6 | 1 | C143 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.1360100D+01 |
| HS93 | 6 | 2 | C144 | 0 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0.1000000D+26 |
| HS95 | 6 | 4 | C145 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 4 | 0.1562000D-01 |
| HS96 | 6 | 4 | C146 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 4 | 0.1562000D-01 |
| HS97 | 6 | 4 | C147 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 4 | 0.3135800D+01 |
| HS98 | 6 | 4 | C148 | 0 | 0 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 4 | 0.3135800D+01 |
| HS99 | 7 | 2 | C149 | 0 | 0 | 0 | 0 | 7 | 0 | 1 | 0 | 2 | 0 | 0 | 0.1000000D+26 |
| HS99EXP | 31 | 21 | C311 | 21 | 3 | 0 | 0 | 7 | 0 | 1 | 0 | 21 | 0 | 0 | 0.1000000D+26 |
| HUBFIT | 2 | 0 | U288 | 1 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.4717700D-02 |
| HYDCAR20 | 99 | 99 | C170 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 99 | 0 | 0 | 0.5261800D-07 |
| HYDCAR6 | 29 | 29 | C169 | 29 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 29 | 0 | 0 | 0.4803800D-07 |
| HYDROELL | 1009 | 1008 | C175 | 0 | 2 | 0 | 0 | 1007 | 0 | 1 | 0 | 0 | 1008 | 0 | -0.3585500D+07 |
| HYDROELM | 505 | 504 | C174 | 0 | 2 | 0 | 0 | 503 | 0 | 1 | 0 | 0 | 504 | 0 | -0.3582000D+07 |
| HYDROELS | 169 | 168 | C173 | 0 | 2 | 0 | 0 | 167 | 0 | 1 | 0 | 0 | 168 | 0 | -0.3582300D+07 |
| HYPCIR | 2 | 0 | U297 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.1668400D-22 |
| INTEGREQ | 12 | 0 | U298 | 10 | 2 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.3994100D-21 |
| INTEGREQ | 52 | 0 | U299 | 50 | 2 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.1527400D-20 |
| INTEGREQ | 102 | 0 | U300 | 100 | 2 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.3003700D-20 |
| JENSMP | 2 | 0 | U315 | 2 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.1243600D+03 |
| JNLBRNG1 | 16 | 0 | U301 | 0 | 12 | 4 | 0 | 0 | 1 | 18 | 0 | 0 | 0 | 0 | -0.2247400D+00 |
| JNLBRNG1 | 100 | 0 | U302 | 0 | 36 | 64 | 0 | 0 | 1 | 162 | 0 | 0 | 0 | 0 | -0.1789600D+00 |
| JNLBRNG1 | 529 | 0 | U303 | 0 | 88 | 441 | 0 | 0 | 1 | 968 | 0 | 0 | 0 | 0 | -0.1800500D+00 |
| JNLBRNG1 | 1024 | 0 | U304 | 0 | 124 | 900 | 0 | 0 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.1803000D+00 |
| JNLBRNG1 | 5625 | 0 | U305 | 0 | 296 | 5329 | 0 | 0 | 1 | 10952 | 0 | 0 | 0 | 0 | -0.1805500D+00 |
| JNLBRNG1 | 10000 | 0 | U306 | 0 | 396 | 9604 | 0 | 0 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.1805700D+00 |
| JNLBRNG1 | 15625 | 0 | U307 | 0 | 496 | 15129 | 0 | 0 | 1 | 30752 | 0 | 0 | 0 | 0 | -0.1805800D+00 |
| JNLBRNG2 | 16 | 0 | U308 | 0 | 12 | 4 | 0 | 0 | 1 | 18 | 0 | 0 | 0 | 0 | -0.4764000D+01 |
| JNLBRNG2 | 100 | 0 | U309 | 0 | 36 | 64 | 0 | 0 | 1 | 162 | 0 | 0 | 0 | 0 | -0.3952800D+01 |
| JNLBRNG2 | 529 | 0 | U310 | 0 | 88 | 441 | 0 | 0 | 1 | 968 | 0 | 0 | 0 | 0 | -0.4102400D+01 |
| JNLBRNG2 | 1024 | 0 | U311 | 0 | 124 | 900 | 0 | 0 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.4124900D+01 |
| JNLBRNG2 | 5625 | 0 | U312 | 0 | 296 | 5329 | 0 | 0 | 1 | 10952 | 0 | 0 | 0 | 0 | -0.4146600D+01 |
| JNLBRNG2 | 10000 | 0 | U313 | 0 | 396 | 9604 | 0 | 0 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.4148700D+01 |
| JNLBRNG2 | 15625 | 0 | U314 | 0 | 496 | 15129 | 0 | 0 | 1 | 30752 | 0 | 0 | 0 | 0 | -0.4149600D+01 |
| KOWOSB | 4 | 0 | U316 | 4 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0.3078000D-03 |
| LCH | 30 | 1 | C264 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.3756500D+01 |

Problem characteristics ( 8 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| LCH | 150 | 1 | C265 | 150 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.4229600D+01 |
| LCH | 300 | 1 | C266 | 300 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.4288700D+01 |
| LCH | 600 | 1 | C267 | 600 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.4318300D+01 |
| LEAKNET | 156 | 153 | C192 | 80 | 0 | 70 | 0 | 6 | 1 | 0 | 73 | 80 | 0 | 0 | 0.8000300D+01 |
| LEWISPOL | 6 | 9 | C193 | 0 | 0 | 0 | 0 | 6 | 0 | 1 | 3 | 6 | 0 | 0 | 0.1000000D+26 |
| LIARWHD | 36 | 0 | U290 | 36 | 0 | 0 | 0 | 0 | 0 | 70 | 0 | 0 | 0 | 0 | 0.4647200D-18 |
| LIARWHD | 100 | 0 | U291 | 100 | 0 | 0 | 0 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0.1220300D-29 |
| LIARWHD | 500 | 0 | U292 | 500 | 0 | 0 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| LIARWHD | 1000 | 0 | U293 | 1000 | 0 | 0 | 0 | 0 | 0 | 1998 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| LIARWHD | 5000 | 0 | U294 | 5000 | 0 | 0 | 0 | 0 | 0 | 9998 | 0 | 0 | 0 | 0 | 0.4893100D-21 |
| LIARWHD | 10000 | 0 | U295 | 10000 | 0 | 0 | 0 | 0 | 0 | 19998 | 0 | 0 | 0 | 0 | 0.1540500D-21 |
| LINVERSE | 19 | 0 | U621 | 9 | 0 | 10 | 0 | 0 | 0 | 27 | 0 | 0 | 0 | 0 | 0.6000000D+01 |
| LINVERSE | 199 | 0 | U622 | 99 | 0 | 100 | 0 | 0 | 0 | 297 | 0 | 0 | 0 | 0 | 0.6800000D+02 |
| LINVERSE | 999 | 0 | U623 | 499 | 0 | 500 | 0 | 0 | 0 | 1497 | 0 | 0 | 0 | 0 | 0.3400000D+03 |
| LINVERSE | 1999 | 0 | U624 | 999 | 0 | 1000 | 0 | 0 | 0 | 2997 | 0 | 0 | 0 | 0 | 0.6810000D+03 |
| LMINSURF | 16 | 0 | U317 | 4 | 12 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 49 | 0 | U318 | 25 | 24 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 64 | 0 | U319 | 36 | 28 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 121 | 0 | U320 | 81 | 40 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 961 | 0 | U321 | 841 | 120 | 0 | 0 | 0 | 0 | 900 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 1024 | 0 | U322 | 900 | 124 | 0 | 0 | 0 | 0 | 961 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 5625 | 0 | U323 | 5329 | 296 | 0 | 0 | 0 | 0 | 5476 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 10000 | 0 | U324 | 9604 | 396 | 0 | 0 | 0 | 0 | 9801 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LMINSURF | 15625 | 0 | U325 | 15129 | 496 | 0 | 0 | 0 | 0 | 15376 | 0 | 0 | 0 | 0 | 0.9000000D+01 |
| LSQFIT | 2 | 0 | U287 | 1 | 0 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.9435300D-02 |
| LUBRIF | 151 | 100 | C194 | 51 | 2 | 49 | 0 | 49 | 0 | 1 | 51 | 49 | 0 | 0 | 0.1000000D+26 |
| LUBRIF | 751 | 500 | C195 | 251 | 2 | 249 | 0 | 249 | 0 | 1 | 251 | 249 | 0 | 0 | 0.1000000D+26 |
| MANCINO | 10 | 0 | U326 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.7585400D-28 |
| MANCINO | 20 | 0 | U327 | 20 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.4381200D-25 |
| MANCINO | 30 | 0 | U328 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0.4385200D-24 |
| MANCINO | 50 | 0 | U329 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.9999800D-23 |
| MANNE | 300 | 200 | C176 | 0 | 1 | 199 | 0 | 100 | 0 | 1 | 0 | 0 | 100 | 100 | -0.9745700D+00 |
| MANNE | 1095 | 730 | C177 | 0 | 1 | 729 | 0 | 365 | 0 | 1 | 0 | 0 | 365 | 365 | -0.9745700D+00 |
| MARATOS | 2 | 1 | U330 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | -0.1000000D+01 |
| MARATOSB | 2 | 0 | U331 | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| MATRIX2 | 6 | 2 | C191 | 2 | 0 | 2 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0.1758700D-17 |
| MAXLIKA | 8 | 0 | C197 | 0 | 0 | 0 | 0 | 8 | 0 | 235 | 0 | 0 | 0 | 0 | 0.1136300D+04 |
| MCCORMCK | 10 | 0 | U332 | 0 | 0 | 0 | 0 | 10 | 0 | 9 | 0 | 0 | 0 | 0 | -0.9598000D+01 |
| MCCORMCK | 50 | 0 | U333 | 0 | 0 | 0 | 0 | 50 | 0 | 49 | 0 | 0 | 0 | 0 | -0.4612700D+02 |
| MCCORMCK | 100 | 0 | U334 | 0 | 0 | 0 | 0 | 100 | 0 | 99 | 0 | 0 | 0 | 0 | -0.9178800D+02 |
| MCCORMCK | 500 | 0 | U335 | 0 | 0 | 0 | 0 | 500 | 0 | 499 | 0 | 0 | 0 | 0 | -0.4570800D+03 |
| MCCORMCK | 1000 | 0 | U336 | 0 | 0 | 0 | 0 | 1000 | 0 | 999 | 0 | 0 | 0 | 0 | -0.9136900D+03 |
| MCCORMCK | 5000 | 0 | U337 | 0 | 0 | 0 | 0 | 5000 | 0 | 4999 | 0 | 0 | 0 | 0 | -0.4566600D+04 |
| MCCORMCK | 10000 | 0 | U338 | 0 | 0 | 0 | 0 | 10000 | 0 | 9999 | 0 | 0 | 0 | 0 | -0.9132700D+04 |
| MDHOLE | 2 | 0 | U339 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| METHANB8 | 31 | 31 | C172 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0.1843100D-09 |
| METHANL8 | 31 | 31 | C171 | 31 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0.3201300D-08 |
| MEXHAT | 2 | 0 | U340 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | -0.4001000D-01 |
| MEYER3 | 3 | 0 | U341 | 3 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0.8794600D+02 |
| MINPERM | 5 | 5 | C182 | 0 | 0 | 1 | 0 | 4 | 1 | 0 | 4 | 1 | 0 | 0 | 0.4999900D+00 |
| MINPERM | 13 | 10 | C183 | 0 | 0 | 4 | 0 | 9 | 1 | 0 | 6 | 4 | 0 | 0 | 0.2222200D+00 |
| MINPERM | 27 | 19 | C184 | 0 | 0 | 11 | 0 | 16 | 1 | 0 | 8 | 11 | 0 | 0 | 0.9374900D-01 |
| MINPERM | 51 | 36 | C185 | 0 | 0 | 26 | 0 | 25 | 1 | 0 | 10 | 26 | 0 | 0 | 0.3840000D-01 |
| MINPERM | 93 | 69 | C186 | 0 | 0 | 57 | 0 | 36 | 1 | 0 | 12 | 57 | 0 | 0 | 0.1543200D-01 |
| MINPERM | 169 | 134 | C187 | 0 | 0 | 120 | 0 | 49 | 1 | 0 | 14 | 120 | 0 | 0 | 0.6119400D-02 |
| MINPERM | 311 | 263 | C188 | 0 | 0 | 247 | 0 | 64 | 1 | 0 | 16 | 247 | 0 | 0 | 0.2402900D-02 |
| MINPERM | 583 | 520 | C189 | 0 | 0 | 502 | 0 | 81 | 1 | 0 | 18 | 502 | 0 | 0 | 0.9364000D-03 |
| MINPERM | 1113 | 1033 | C190 | 0 | 0 | 1013 | 0 | 100 | 1 | 0 | 20 | 1013 | 0 | 0 | 0.3628800D-03 |
| MINSURF | 64 | 0 | C179 | 36 | 28 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.1000000D+01 |
| MISTAKE | 9 | 13 | C196 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 13 | -0.1000000D+01 |
| MSQRTA | 4 | 0 | U342 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.2929900D-14 |
| MSQRTA | 49 | 0 | U343 | 49 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.3193800D-18 |
| MSQRTA | 100 | 0 | U344 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.9358100D-16 |
| MSQRTA | 529 | 0 | U345 | 529 | 0 | 0 | 0 | 0 | 0 | 529 | 0 | 0 | 0 | 0 | 0.3011500D-09 |
| MSQRTA | 1024 | 0 | U346 | 1024 | 0 | 0 | 0 | 0 | 0 | 1024 | 0 | 0 | 0 | 0 | 0.3176200D-09 |

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| MSQRTB | 9 | 0 | U347 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0.1423200D-14 |
| MSQRTB | 49 | 0 | U348 | 49 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.3170400D-13 |
| MSQRTB | 100 | 0 | U349 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.4101300D-12 |
| MSQRTB | 529 | 0 | U350 | 529 | 0 | 0 | 0 | 0 | 0 | 529 | 0 | 0 | 0 | 0 | 0.1194200D-09 |
| MSQRTB | 1024 | 0 | U351 | 1024 | 0 | 0 | 0 | 0 | 0 | 1024 | 0 | 0 | 0 | 0 | 0.1167400D-09 |
| MWRIGHT | 5 | 3 | C203 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 3 | 0 | 0 | 0.2727800D+01 |
| NGONE | 8 | 8 | C198 | 0 | 3 | 4 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 6 | -0.5000000D+00 |
| NGONE | 12 | 19 | C199 | 0 | 3 | 8 | 0 | 1 | 0 | 1 | 0 | 0 | 4 | 15 | -0.6203700D+00 |
| NGONE | 50 | 323 | C200 | 0 | 3 | 46 | 0 | 1 | 0 | 1 | 0 | 0 | 23 | 300 | -0.6431300D+00 |
| NGONE | 100 | 1273 | C201 | 0 | 3 | 96 | 0 | 1 | 0 | 1 | 0 | 0 | 48 | 1225 | -0.6432600D+00 |
| NGONE | 500 | 31373 | C202 | 0 | 3 | 496 | 0 | 1 | 0 | 1 | 0 | 0 | 248 | 31125 | 0.1000000D+26 |
| NLMSURF | 16 | 0 | U356 | 4 | 12 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0.3215900D+02 |
| NLMSURF | 49 | 0 | U357 | 25 | 24 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0.3618200D+02 |
| NLMSURF | 64 | 0 | U358 | 36 | 28 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.3660100D+02 |
| NLMSURF | 121 | 0 | U359 | 81 | 40 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.3737900D+02 |
| NLMSURF | 961 | 0 | U360 | 841 | 120 | 0 | 0 | 0 | 0 | 900 | 0 | 0 | 0 | 0 | 0.3857200D+02 |
| NLMSURF | 1024 | 0 | U361 | 900 | 124 | 0 | 0 | 0 | 0 | 961 | 0 | 0 | 0 | 0 | 0.3859100D+02 |
| NLMSURF | 5625 | 0 | U362 | 5329 | 296 | 0 | 0 | 0 | 0 | 5476 | 0 | 0 | 0 | 0 | 0.3894900D+02 |
| NLMSURF | 10000 | 0 | U363 | 9604 | 396 | 0 | 0 | 0 | 0 | 9801 | 0 | 0 | 0 | 0 | 0.3901600D+02 |
| NLMSURF | 15625 | 0 | U364 | 15129 | 496 | 0 | 0 | 0 | 0 | 15376 | 0 | 0 | 0 | 0 | 0.3905600D+02 |
| NONDIA | 10 | 0 | U370 | 10 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0.4455600D+01 |
| NONDIA | 20 | 0 | U371 | 20 | 0 | 0 | 0 | 0 | 0 | 38 | 0 | 0 | 0 | 0 | 0.7959600D+01 |
| NONDIA | 30 | 0 | U372 | 30 | 0 | 0 | 0 | 0 | 0 | 58 | 0 | 0 | 0 | 0 | 0.1217200D-22 |
| NONDIA | 50 | 0 | U373 | 50 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.8358000D-26 |
| NONDIA | 90 | 0 | U374 | 90 | 0 | 0 | 0 | 0 | 0 | 178 | 0 | 0 | 0 | 0 | 0.4110700D-23 |
| NONDIA | 100 | 0 | U375 | 100 | 0 | 0 | 0 | 0 | 0 | 198 | 0 | 0 | 0 | 0 | 0.8020700D-27 |
| NONDIA | 500 | 0 | U376 | 500 | 0 | 0 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0.1429700D-21 |
| NONDIA | 1000 | 0 | U377 | 1000 | 0 | 0 | 0 | 0 | 0 | 1998 | 0 | 0 | 0 | 0 | 0.3585400D-21 |
| NONDIA | 5000 | 0 | U378 | 5000 | 0 | 0 | 0 | 0 | 0 | 9998 | 0 | 0 | 0 | 0 | 0.1393000D-17 |
| NONDIA | 10000 | 0 | U379 | 10000 | 0 | 0 | 0 | 0 | 0 | 19998 | 0 | 0 | 0 | 0 | 0.7189000D-24 |
| NONDQUAR | 100 | 0 | U352 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.2279000D-08 |
| NONDQUAR | 500 | 0 | U353 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.2204300D-08 |
| NONDQUAR | 1000 | 0 | U354 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.7494700D-09 |
| NONDQUAR | 5000 | 0 | U355 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.6831200D-09 |
| NONMSQRT | 9 | 0 | U365 | 9 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0.7518400D+00 |
| NONMSQRT | 49 | 0 | U366 | 49 | 0 | 0 | 0 | 0 | 0 | 49 | 0 | 0 | 0 | 0 | 0.1075200D+01 |
| NONMSQRT | 100 | 0 | U367 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1805500D+02 |
| NONMSQRT | 529 | 0 | U368 | 529 | 0 | 0 | 0 | 0 | 0 | 529 | 0 | 0 | 0 | 0 | 0.1000000D+26 |
| NONMSQRT | 1024 | 0 | U369 | 1024 | 0 | 0 | 0 | 0 | 0 | 1024 | 0 | 0 | 0 | 0 | 0.1000000D+26 |
| NONSCOMP | 25 | 0 | U380 | 0 | 0 | 0 | 0 | 25 | 0 | 25 | 0 | 0 | 0 | 0 | 0.1840500D-17 |
| NONSCOMP | 50 | 0 | U381 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 0 | 0 | 0 | 0 | 0.6439000D-20 |
| NONSCOMP | 100 | 0 | U382 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1810000D-19 |
| NONSCOMP | 500 | 0 | U383 | 0 | 0 | 0 | 0 | 500 | 0 | 500 | 0 | 0 | 0 | 0 | 0.1125000D-18 |
| NONSCOMP | 1000 | 0 | U384 | 0 | 0 | 0 | 0 | 1000 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.2302700D-18 |
| NONSCOMP | 5000 | 0 | U385 | 0 | 0 | 0 | 0 | 5000 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.1178500D-17 |
| NONSCOMP | 10000 | 0 | U386 | 0 | 0 | 0 | 0 | 10000 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.2364500D-17 |
| NYSTROM5 | 18 | 20 | U619 | 15 | 3 | 0 | 0 | 0 | 0 | 0 | 2 | 18 | 0 | 0 | 0.6118300D-12 |
| OBSTCLAE | 16 | 0 | U387 | 0 | 12 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0.7536600D+00 |
| OBSTCLAE | 100 | 0 | U388 | 0 | 36 | 0 | 0 | 64 | 0 | 64 | 0 | 0 | 0 | 0 | 0.1397900D+01 |
| OBSTCLAE | 529 | 0 | U389 | 0 | 88 | 0 | 0 | 441 | 0 | 441 | 0 | 0 | 0 | 0 | 0.1678000D+01 |
| OBSTCLAE | 1024 | 0 | U390 | 0 | 124 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0.1748300D+01 |
| OBSTCLAE | 5625 | 0 | U391 | 0 | 296 | 0 | 0 | 5329 | 0 | 5329 | 0 | 0 | 0 | 0 | 0.1863000D+01 |
| OBSTCLAE | 10000 | 0 | U392 | 0 | 396 | 0 | 0 | 9604 | 0 | 9604 | 0 | 0 | 0 | 0 | 0.1886500D+01 |
| OBSTCLAE | 15625 | 0 | U393 | 0 | 496 | 0 | 0 | 15129 | 0 | 15129 | 0 | 0 | 0 | 0 | 0.1000000D+26 |
| OBSTCLAL | 16 | 0 | U394 | 0 | 12 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0.7536600D+00 |
| OBSTCLAL | 100 | 0 | U395 | 0 | 36 | 0 | 0 | 64 | 0 | 64 | 0 | 0 | 0 | 0 | 0.1397900D+01 |
| OBSTCLAL | 529 | 0 | U396 | 0 | 88 | 0 | 0 | 441 | 0 | 441 | 0 | 0 | 0 | 0 | 0.1678000D+01 |
| OBSTCLAL | 1024 | 0 | U397 | 0 | 124 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0.1748300D+01 |
| OBSTCLAL | 5625 | 0 | U398 | 0 | 296 | 0 | 0 | 5329 | 0 | 5329 | 0 | 0 | 0 | 0 | 0.1863000D+01 |
| OBSTCLAL | 10000 | 0 | U399 | 0 | 396 | 0 | 0 | 9604 | 0 | 9604 | 0 | 0 | 0 | 0 | 0.1886500D+01 |
| OBSTCLAL | 15625 | 0 | U400 | 0 | 496 | 0 | 0 | 15129 | 0 | 15129 | 0 | 0 | 0 | 0 | 0.1901000D+01 |
| OBSTCLBL | 16 | 0 | U401 | 0 | 12 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | -0.8110800D-02 |
| OBSTCLBL | 100 | 0 | U402 | 0 | 36 | 0 | 0 | 64 | 0 | 64 | 0 | 0 | 0 | 0 | 0.2875000D+01 |
| OBSTCLBL | 529 | 0 | U403 | 0 | 88 | 0 | 0 | 441 | 0 | 441 | 0 | 0 | 0 | 0 | 0.6519300D+01 |
| OBSTCLBL | 1024 | 0 | U404 | 0 | 124 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0.6887100D+01 |

Problem characteristics ( 10 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| OBSTCLBL | 5625 | 0 | U405 | 0 | 296 | 0 | 0 | 5329 | 0 | 5329 | 0 | 0 | 0 | 0 | 0.7230900D+01 |
| OBSTCLBL | 10000 | 0 | U406 | 0 | 396 | 0 | 0 | 9604 | 0 | 9604 | 0 | 0 | 0 | 0 | 0.7272200D+01 |
| OBSTCLBL | 15625 | 0 | U407 | 0 | 496 | 0 | 0 | 15129 | 0 | 15129 | 0 | 0 | 0 | 0 | 0.7295800D+01 |
| OBSTCLBM | 16 | 0 | U408 | 0 | 12 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | -0.8110800D-02 |
| OBSTCLBM | 100 | 0 | U409 | 0 | 36 | 0 | 0 | 64 | 0 | 64 | 0 | 0 | 0 | 0 | 0.2875000D+01 |
| OBSTCLBM | 529 | 0 | U410 | 0 | 88 | 0 | 0 | 441 | 0 | 441 | 0 | 0 | 0 | 0 | 0.6519300D+01 |
| OBSTCLBM | 1024 | 0 | U411 | 0 | 124 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0.6887100D+01 |
| OBSTCLBM | 5625 | 0 | U412 | 0 | 296 | 0 | 0 | 5329 | 0 | 5329 | 0 | 0 | 0 | 0 | 0.7230900D+01 |
| OBSTCLBM | 10000 | 0 | U413 | 0 | 396 | 0 | 0 | 9604 | 0 | 9604 | 0 | 0 | 0 | 0 | 0.7272200D+01 |
| OBSTCLBM | 15625 | 0 | U414 | 0 | 496 | 0 | 0 | 15129 | 0 | 15129 | 0 | 0 | 0 | 0 | 0.7295800D+01 |
| OBSTCLBU | 16 | 0 | U415 | 0 | 12 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | -0.8110800D-02 |
| OBSTCLBU | 100 | 0 | U416 | 0 | 36 | 0 | 0 | 64 | 0 | 64 | 0 | 0 | 0 | 0 | 0.2875000D+01 |
| OBSTCLBU | 529 | 0 | U417 | 0 | 88 | 0 | 0 | 441 | 0 | 441 | 0 | 0 | 0 | 0 | 0.6519300D+01 |
| OBSTCLBU | 1024 | 0 | U418 | 0 | 124 | 0 | 0 | 900 | 0 | 900 | 0 | 0 | 0 | 0 | 0.6887100D+01 |
| OBSTCLBU | 5625 | 0 | U419 | 0 | 296 | 0 | 0 | 5329 | 0 | 5329 | 0 | 0 | 0 | 0 | 0.7230900D+01 |
| OBSTCLBU | 10000 | 0 | U420 | 0 | 396 | 0 | 0 | 9604 | 0 | 9604 | 0 | 0 | 0 | 0 | 0.7272200D+01 |
| OBSTCLBU | 15625 | 0 | U421 | 0 | 496 | 0 | 0 | 15129 | 0 | 15129 | 0 | 0 | 0 | 0 | 0.7295800D+01 |
| OPTCNTRL | 32 | 20 | C178 | 9 | 3 | 10 | 0 | 10 | 0 | 1 | 10 | 10 | 0 | 0 | 0.5500000D+03 |
| OPTMASS | 70 | 55 | C204 | 66 | 4 | 0 | 0 | 0 | 0 | 1 | 44 | 0 | 0 | 11 | -0.1895400D+00 |
| OPTMASS | 610 | 505 | C205 | 606 | 4 | 0 | 0 | 0 | 0 | 1 | 404 | 0 | 0 | 101 | 0.1000000D+26 |
| OPTMASS | 1210 | 1005 | C206 | 1206 | 4 | 0 | 0 | 0 | 0 | 1 | 804 | 0 | 0 | 201 | 0.1000000D+26 |
| OPTMASS | 3010 | 2505 | C207 | 3006 | 4 | 0 | 0 | 0 | 0 | 1 | 2004 | 0 | 0 | 501 | 0.1000000D+26 |
| ORTHREGA | 133 | 64 | C208 | 133 | 0 | 0 | 0 | 0 | 0 | 128 | 0 | 64 | 0 | 0 | 0.3503000D+03 |
| ORTHREGA | 517 | 256 | C209 | 517 | 0 | 0 | 0 | 0 | 0 | 512 | 0 | 256 | 0 | 0 | 0.1414100D+04 |
| ORTHREGA | 2053 | 1024 | C210 | 2053 | 0 | 0 | 0 | 0 | 0 | 2048 | 0 | 1024 | 0 | 0 | 0.5661400D+04 |
| ORTHREGA | 8197 | 4096 | C211 | 8197 | 0 | 0 | 0 | 0 | 0 | 8192 | 0 | 4096 | 0 | 0 | 0.2264800D+05 |
| ORTHREGB | 27 | 6 | C212 | 27 | 0 | 0 | 0 | 0 | 0 | 18 | 0 | 6 | 0 | 0 | 0.4398900D-19 |
| ORTHREGC | 25 | 10 | C213 | 25 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 10 | 0 | 0 | 0.3990500D+00 |
| ORTHREGC | 105 | 50 | C214 | 105 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 50 | 0 | 0 | 0.1975500D+01 |
| ORTHREGC | 505 | 250 | C215 | 505 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 250 | 0 | 0 | 0.9581900D+01 |
| ORTHREGC | 1005 | 500 | C216 | 1005 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 500 | 0 | 0 | 0.1879100D+02 |
| ORTHREGC | 5005 | 2500 | C217 | 5005 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 2500 | 0 | 0 | 0.9481300D+02 |
| ORTHREGC | 10005 | 5000 | C218 | 10005 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 5000 | 0 | 0 | 0.1895900D+03 |
| ORTHREGD | 23 | 10 | C219 | 23 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 10 | 0 | 0 | 0.3412100D+01 |
| ORTHREGD | 103 | 50 | C220 | 103 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 50 | 0 | 0 | 0.1559000D+02 |
| ORTHREGD | 503 | 250 | C221 | 503 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 250 | 0 | 0 | 0.7610400D+02 |
| ORTHREGD | 1003 | 500 | C222 | 1003 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 500 | 0 | 0 | 0.1512400D+03 |
| ORTHREGD | 5003 | 2500 | C223 | 5003 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 2500 | 0 | 0 | 0.7620600D+03 |
| ORTHREGD | 10003 | 5000 | C224 | 10003 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 5000 | 0 | 0 | 0.1523900D+04 |
| ORTHREGE | 36 | 20 | C225 | 35 | 0 | 1 | 0 | 0 | 0 | 30 | 0 | 20 | 0 | 0 | 0.3390800D+01 |
| ORTHREGF | 80 | 25 | C226 | 78 | 0 | 2 | 0 | 0 | 1 | 75 | 0 | 25 | 0 | 0 | 0.9900800D+00 |
| ORTHREGF | 152 | 49 | C227 | 150 | 0 | 2 | 0 | 0 | 1 | 147 | 0 | 49 | 0 | 0 | 0.1315000D+01 |
| ORTHREGF | 305 | 100 | C228 | 303 | 0 | 2 | 0 | 0 | 1 | 300 | 0 | 100 | 0 | 0 | 0.4515800D+01 |
| ORTHREGF | 680 | 225 | C229 | 678 | 0 | 2 | 0 | 0 | 1 | 675 | 0 | 225 | 0 | 0 | 0.9185500D+01 |
| ORTHREGF | 1205 | 400 | C230 | 1203 | 0 | 2 | 0 | 0 | 1 | 1200 | 0 | 400 | 0 | 0 | 0.1620000D+02 |
| OSBORNEA | 5 | 0 | U422 | 5 | 0 | 0 | 0 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0.5464900D-04 |
| OSBORNEB | 11 | 0 | U423 | 11 | 0 | 0 | 0 | 0 | 0 | 65 | 0 | 0 | 0 | 0 | 0.4013800D-01 |
| PALMER1 | 4 | 0 | U424 | 1 | 0 | 3 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0.1175500D+05 |
| PALMER1A | 6 | 0 | U425 | 4 | 0 | 2 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0.8988300D-01 |
| PALMER1B | 4 | 0 | U426 | 2 | 0 | 2 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0.3447300D+01 |
| PALMER1C | 8 | 0 | U427 | 8 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0.9760500D-01 |
| PALMER1D | 7 | 0 | U428 | 7 | 0 | 0 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0.6526700D+00 |
| PALMER1E | 8 | 0 | U429 | 7 | 0 | 1 | 0 | 0 | 0 | 35 | 0 | 0 | 0 | 0 | 0.8352300D-03 |
| PALMER2 | 4 | 0 | U430 | 1 | 0 | 3 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.3651100D+04 |
| PALMER2A | 6 | 0 | U431 | 4 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.1711000D-01 |
| PALMER2B | 4 | 0 | U432 | 2 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.6232700D+00 |
| PALMER2C | 8 | 0 | U433 | 8 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.1436900D-01 |
| PALMER2E | 8 | 0 | U434 | 7 | 0 | 1 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.2065000D-03 |
| PALMER3 | 4 | 0 | U435 | 1 | 0 | 3 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.2266000D+04 |
| PALMER3A | 6 | 0 | U436 | 4 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.2043100D-01 |
| PALMER3B | 4 | 0 | U437 | 2 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.4227600D+01 |
| PALMER3C | 8 | 0 | U438 | 8 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.1953800D-01 |
| PALMER3E | 8 | 0 | U439 | 7 | 0 | 1 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.5074100D-04 |
| PALMER4 | 4 | 0 | U440 | 1 | 0 | 3 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.2285400D+04 |
| PALMER4A | 6 | 0 | U441 | 4 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.4060600D-01 |

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| PALMER4B | 4 | 0 | U442 | 2 | 0 | 2 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.6835100D+01 |
| PALMER4C | 8 | 0 | U443 | 8 | 0 | 0 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.5031100D-01 |
| PALMER4E | 8 | 0 | U444 | 7 | 0 | 1 | 0 | 0 | 0 | 23 | 0 | 0 | 0 | 0 | 0.1480000D-03 |
| PENALTY1 | 4 | 0 | U446 | 4 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.2250000D-04 |
| PENALTY1 | 10 | 0 | U447 | 10 | 0 | 0 | 0 | 0 | 0 | 11 | 0 | 0 | 0 | 0 | 0.7090500D-04 |
| PENALTY1 | 50 | 0 | U448 | 50 | 0 | 0 | 0 | 0 | 0 | 51 | 0 | 0 | 0 | 0 | 0.4317900D-03 |
| PENALTY1 | 100 | 0 | U449 | 100 | 0 | 0 | 0 | 0 | 0 | 101 | 0 | 0 | 0 | 0 | 0.9024900D-03 |
| PENALTY1 | 500 | 0 | U450 | 500 | 0 | 0 | 0 | 0 | 0 | 501 | 0 | 0 | 0 | 0 | 0.4778800D-02 |
| PENALTY1 | 1000 | 0 | U451 | 1000 | 0 | 0 | 0 | 0 | 0 | 1001 | 0 | 0 | 0 | 0 | 0.9686200D-02 |
| PENALTY2 | 4 | 0 | U452 | 4 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0.9407500D-05 |
| PENALTY2 | 10 | 0 | U453 | 10 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.2936600D-03 |
| PENALTY2 | 50 | 0 | U454 | 50 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.4296100D+01 |
| PENALTY2 | 100 | 0 | U455 | 100 | 0 | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 0 | 0 | 0.9709600D+05 |
| PENALTY3 | 50 | 0 | U456 | 50 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0.1000000D-02 |
| PENALTY3 | 100 | 0 | U457 | 100 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 0.9999400D-03 |
| PENTAGON | 6 | 15 | C231 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 15 | 0 | 0.1365200D-03 |
| POWELLBS | 2 | 0 | U458 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.2667600D-21 |
| POWELLSG | 4 | 0 | U472 | 4 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0.2394200D-09 |
| POWELLSG | 8 | 0 | U473 | 8 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0.1109100D-08 |
| POWELLSG | 16 | 0 | U474 | 16 | 0 | 0 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 0 | 0.2845300D-08 |
| POWELLSG | 20 | 0 | U475 | 20 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.3712700D-08 |
| POWELLSG | 36 | 0 | U476 | 36 | 0 | 0 | 0 | 0 | 0 | 36 | 0 | 0 | 0 | 0 | 0.7180700D-08 |
| POWELLSG | 40 | 0 | U477 | 40 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0.8047600D-08 |
| POWELLSG | 60 | 0 | U478 | 60 | 0 | 0 | 0 | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 0.1238100D-07 |
| POWELLSG | 80 | 0 | U479 | 80 | 0 | 0 | 0 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0.1671500D-07 |
| POWELLSG | 100 | 0 | U480 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.2104800D-07 |
| POWELLSG | 500 | 0 | U481 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.1076500D-06 |
| POWELLSG | 1000 | 0 | U482 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.2159100D-06 |
| POWELLSG | 5000 | 0 | U483 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.6095000D-06 |
| POWELLSG | 10000 | 0 | U484 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.1219300D-05 |
| POWELLSQ | 2 | 0 | U485 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.5520700D-30 |
| POWER | 10 | 0 | U459 | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2716600D-08 |
| POWER | 20 | 0 | U460 | 20 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2212900D-08 |
| POWER | 30 | 0 | U461 | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.2267400D-08 |
| POWER | 50 | 0 | U462 | 50 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1280300D-08 |
| POWER | 75 | 0 | U463 | 75 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1604600D-08 |
| POWER | 100 | 0 | U464 | 100 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1328200D-08 |
| POWER | 500 | 0 | U465 | 500 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.1507800D-08 |
| POWER | 1000 | 0 | U466 | 1000 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.4750600D-08 |
| PROBPENL | 10 | 0 | U467 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 0 | -0.2648900D+06 |
| PROBPENL | 50 | 0 | U468 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 0 | 0 | 0 | 0 | 0.3918400D-05 |
| PROBPENL | 100 | 0 | U469 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1979800D-05 |
| PROBPENL | 500 | 0 | U470 | 0 | 0 | 0 | 0 | 500 | 0 | 500 | 0 | 0 | 0 | 0 | 0.3992000D-06 |
| PRODPL0 | 60 | 29 | C318 | 0 | 0 | 60 | 0 | 0 | 1 | 0 | 20 | 0 | 5 | 4 | 0.5879000D+02 |
| PRODPL1 | 60 | 29 | C319 | 0 | 0 | 60 | 0 | 0 | 1 | 0 | 20 | 0 | 5 | 4 | 0.3573900D+02 |
| PSPDOC | 4 | 0 | U471 | 3 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.2414200D+01 |
| QUARTC | 25 | 0 | U486 | 25 | 0 | 0 | 0 | 0 | 0 | 25 | 0 | 0 | 0 | 0 | 0.1386500D-07 |
| QUARTC | 100 | 0 | U487 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.5044400D-08 |
| QUARTC | 500 | 0 | U488 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.3595100D-07 |
| QUARTC | 1000 | 0 | U489 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.8910200D-08 |
| QUARTC | 5000 | 0 | U490 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.1300300D-09 |
| QUARTC | 10000 | 0 | U491 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.6338900D-11 |
| READING1 | 202 | 100 | C321 | 0 | 1 | 0 | 0 | 201 | 0 | 100 | 0 | 100 | 0 | 0 | -0.1604900D+00 |
| READING2 | 303 | 200 | C322 | 100 | 2 | 0 | 0 | 201 | 1 | 0 | 200 | 0 | 0 | 0 | -0.1257500D-01 |
| READING3 | 202 | 101 | C323 | 0 | 0 | 0 | 0 | 202 | 0 | 100 | 1 | 100 | 0 | 0 | -0.1526200D+00 |
| RECIPE | 3 | 0 | U492 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.6922200D-08 |
| ROSENBR | 2 | 0 | U493 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0.1107200D-20 |
| S277-280 | 4 | 4 | C232 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 4 | 0 | 0.5076200D+01 |
| S277-280 | 6 | 6 | C233 | 0 | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 0 | 0.7838500D+01 |
| S277-280 | 8 | 8 | C234 | 0 | 0 | 8 | 0 | 0 | 1 | 0 | 0 | 0 | 8 | 0 | 0.1060600D+02 |
| S277-280 | 10 | 10 | C235 | 0 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 0 | 10 | 0 | 0.1337500D+02 |
| S308 | 2 | 0 | U620 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.7732000D+00 |
| S316-322 | 2 | 1 | C303 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.3343100D+03 |
| S316-322 | 2 | 1 | C304 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.3724700D+03 |
| S316-322 | 2 | 1 | C305 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.3343100D+03 |

Problem characteristics ( 12 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| S316-322 | 2 | 1 | C306 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.4127500D+03 |
| S316-322 | 2 | 1 | C307 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.3724700D+03 |
| S316-322 | 2 | 1 | C308 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.4127500D+03 |
| S316-322 | 2 | 1 | C309 | 2 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0.4961100D+03 |
| SCHMVETT | 3 | 0 | U494 | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | -0.3000000D+01 |
| SCHMVETT | 10 | 0 | U495 | 10 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | -0.2400000D+02 |
| SCHMVETT | 100 | 0 | U496 | 100 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | -0.2940000D+03 |
| SCHMVETT | 500 | 0 | U497 | 500 | 0 | 0 | 0 | 0 | 0 | 498 | 0 | 0 | 0 | 0 | -0.1494000D+04 |
| SCHMVETT | 1000 | 0 | U498 | 1000 | 0 | 0 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | -0.2994000D+04 |
| SCHMVETT | 5000 | 0 | U499 | 5000 | 0 | 0 | 0 | 0 | 0 | 4998 | 0 | 0 | 0 | 0 | -0.1499400D+05 |
| SCHMVETT | 10000 | 0 | U500 | 10000 | 0 | 0 | 0 | 0 | 0 | 9998 | 0 | 0 | 0 | 0 | -0.2999400D+05 |
| SEMICON1 | 12 | 10 | U501 | 0 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0.7715400D-16 |
| SEMICON1 | 52 | 50 | U502 | 0 | 2 | 0 | 0 | 50 | 0 | 0 | 0 | 50 | 0 | 0 | 0.1794400D-19 |
| SEMICON1 | 102 | 100 | U503 | 0 | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 0 | 0 | 0.7526100D-15 |
| SEMICON1 | 502 | 500 | U504 | 0 | 2 | 0 | 0 | 500 | 0 | 0 | 0 | 500 | 0 | 0 | 0.8341200D-22 |
| SEMICON2 | 12 | 10 | U505 | 0 | 2 | 0 | 0 | 10 | 0 | 0 | 0 | 10 | 0 | 0 | 0.1091000D-21 |
| SEMICON2 | 52 | 50 | U506 | 0 | 2 | 0 | 0 | 50 | 0 | 0 | 0 | 50 | 0 | 0 | 0.7517000D-24 |
| SEMICON2 | 102 | 100 | U507 | 0 | 2 | 0 | 0 | 100 | 0 | 0 | 0 | 100 | 0 | 0 | 0.1836600D-17 |
| SEMICON2 | 502 | 500 | U508 | 0 | 2 | 0 | 0 | 500 | 0 | 0 | 0 | 500 | 0 | 0 | 0.3611200D-12 |
| SEMICON2 | 1002 | 1000 | U509 | 0 | 2 | 0 | 0 | 1000 | 0 | 0 | 0 | 1000 | 0 | 0 | 0.2754000D-16 |
| SIMPLLPA | 2 | 2 | C243 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0.1000000D+01 |
| SIMPLLPB | 2 | 3 | C244 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 0.1100000D+01 |
| SINQUAD | 5 | 0 | U510 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.2456000D-10 |
| SINQUAD | 50 | 0 | U511 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.1598800D-09 |
| SINQUAD | 100 | 0 | U512 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1797900D-09 |
| SINQUAD | 500 | 0 | U513 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.5119500D-08 |
| SINQUAD | 1000 | 0 | U514 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.4707600D-08 |
| SINQUAD | 5000 | 0 | U515 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.2314800D-08 |
| SINQUAD | 10000 | 0 | U516 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.1467400D-09 |
| SISSER | 2 | 0 | U517 | 2 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.6116900D-09 |
| SNAIL | 2 | 0 | U518 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0.3160900D-19 |
| SPANHYD | 97 | 33 | C320 | 0 | 16 | 0 | 0 | 81 | 0 | 1 | 33 | 0 | 0 | 0 | 0.2397400D+03 |
| SPMSQRT | 28 | 0 | U519 | 28 | 0 | 0 | 0 | 0 | 0 | 44 | 0 | 0 | 0 | 0 | 0.7253300D-17 |
| SPMSQRT | 100 | 0 | U520 | 100 | 0 | 0 | 0 | 0 | 0 | 164 | 0 | 0 | 0 | 0 | 0.2469000D-16 |
| SPMSQRT | 499 | 0 | U521 | 499 | 0 | 0 | 0 | 0 | 0 | 829 | 0 | 0 | 0 | 0 | 0.1647400D-15 |
| SPMSQRT | 1000 | 0 | U522 | 1000 | 0 | 0 | 0 | 0 | 0 | 1664 | 0 | 0 | 0 | 0 | 0.4356700D-15 |
| SPMSQRT | 4999 | 0 | U523 | 4999 | 0 | 0 | 0 | 0 | 0 | 8329 | 0 | 0 | 0 | 0 | 0.1859500D-14 |
| SPMSQRT | 10000 | 0 | U524 | 10000 | 0 | 0 | 0 | 0 | 0 | 16664 | 0 | 0 | 0 | 0 | 0.3759500D-14 |
| SROSENBR | 10 | 0 | U525 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.4674800D-16 |
| SROSENBR | 50 | 0 | U526 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.2337400D-15 |
| SROSENBR | 100 | 0 | U527 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.4674800D-15 |
| SROSENBR | 500 | 0 | U528 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.2337400D-14 |
| SROSENBR | 1000 | 0 | U529 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.4674800D-14 |
| SROSENBR | 5000 | 0 | U530 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.2337400D-13 |
| SROSENBR | 10000 | 0 | U531 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.2034100D-15 |
| SSEBLIN | 194 | 72 | C245 | 0 | 2 | 24 | 0 | 168 | 1 | 0 | 48 | 0 | 24 | 0 | 0.1617100D+08 |
| SSEBNLN | 194 | 96 | C246 | 0 | 2 | 24 | 0 | 168 | 1 | 0 | 48 | 24 | 24 | 0 | 0.1617100D+08 |
| STEENBRA | 432 | 108 | C236 | 0 | 0 | 432 | 0 | 0 | 0 | 1 | 108 | 0 | 0 | 0 | 0.1695800D+05 |
| STEENBRB | 468 | 108 | C237 | 0 | 0 | 468 | 0 | 0 | 0 | 1 | 108 | 0 | 0 | 0 | 0.9075900D+04 |
| STEENBRC | 540 | 126 | C238 | 0 | 0 | 540 | 0 | 0 | 0 | 1 | 126 | 0 | 0 | 0 | 0.2750500D+05 |
| STEENBRD | 468 | 108 | C239 | 0 | 0 | 468 | 0 | 0 | 0 | 1 | 108 | 0 | 0 | 0 | 0.9030100D+04 |
| STEENBRE | 540 | 126 | C240 | 0 | 0 | 540 | 0 | 0 | 0 | 1 | 126 | 0 | 0 | 0 | 0.2745900D+05 |
| STEENBRF | 468 | 108 | C241 | 0 | 0 | 468 | 0 | 0 | 0 | 1 | 108 | 0 | 0 | 0 | 0.8991800D+04 |
| STEENBRG | 540 | 126 | C242 | 0 | 0 | 540 | 0 | 0 | 0 | 1 | 126 | 0 | 0 | 0 | 0.2742100D+05 |
| SVANBERG | 10 | 10 | C247 | 0 | 0 | 0 | 0 | 10 | 0 | 10 | 0 | 0 | 0 | 10 | 0.1573200D+02 |
| SVANBERG | 20 | 20 | C248 | 0 | 0 | 0 | 0 | 20 | 0 | 20 | 0 | 0 | 0 | 20 | 0.3242800D+02 |
| SVANBERG | 30 | 30 | C249 | 0 | 0 | 0 | 0 | 30 | 0 | 30 | 0 | 0 | 0 | 30 | 0.4914300D+02 |
| SVANBERG | 40 | 40 | C250 | 0 | 0 | 0 | 0 | 40 | 0 | 40 | 0 | 0 | 0 | 40 | 0.6586100D+02 |
| SVANBERG | 50 | 50 | C251 | 0 | 0 | 0 | 0 | 50 | 0 | 50 | 0 | 0 | 0 | 50 | 0.8258200D+02 |
| SVANBERG | 60 | 60 | C252 | 0 | 0 | 0 | 0 | 60 | 0 | 60 | 0 | 0 | 0 | 60 | 0.9930400D+02 |
| SVANBERG | 70 | 70 | C253 | 0 | 0 | 0 | 0 | 70 | 0 | 70 | 0 | 0 | 0 | 70 | 0.1160300D+03 |
| SVANBERG | 80 | 80 | C254 | 0 | 0 | 0 | 0 | 80 | 0 | 80 | 0 | 0 | 0 | 80 | 0.1327500D+03 |
| SVANBERG | 90 | 90 | C255 | 0 | 0 | 0 | 0 | 90 | 0 | 90 | 0 | 0 | 0 | 90 | 0.1494700D+03 |
| SVANBERG | 100 | 100 | C256 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 0 | 0 | 0 | 100 | 0.1662000D+03 |
| SVANBERG | 500 | 500 | C257 | 0 | 0 | 0 | 0 | 500 | 0 | 500 | 0 | 0 | 0 | 500 | 0.8351900D+03 |

Problem characteristics ( 13 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| SVANBERG | 1000 | 1000 | C258 | 0 | 0 | 0 | 0 | 1000 | 0 | 1000 | 0 | 0 | 0 | 1000 | 0.1671400D+04 |
| SVANBERG | 5000 | 5000 | C259 | 0 | 0 | 0 | 0 | 5000 | 0 | 5000 | 0 | 0 | 0 | 5000 | 0.1000000D+26 |
| TAME | 2 | 1 | C260 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0.0000000D+00 |
| TENBARS1 | 18 | 9 | C312 | 4 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 8 | 1 | 0 | 0.2295400D+04 |
| TENBARS2 | 18 | 8 | C313 | 4 | 0 | 14 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 0 | 0.2277900D+04 |
| TENBARS3 | 18 | 8 | C314 | 6 | 0 | 12 | 0 | 0 | 1 | 0 | 0 | 8 | 0 | 0 | 0.2247100D+04 |
| TENBARS4 | 18 | 9 | C315 | 8 | 0 | 10 | 0 | 0 | 1 | 0 | 0 | 8 | 1 | 0 | 0.1000000D+26 |
| TOINTGOR | 50 | 0 | U549 | 50 | 0 | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0.1373900D+04 |
| TOINTGSS | 10 | 0 | U553 | 10 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 50 | 0 | U554 | 50 | 0 | 0 | 0 | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 100 | 0 | U555 | 100 | 0 | 0 | 0 | 0 | 0 | 98 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 500 | 0 | U556 | 500 | 0 | 0 | 0 | 0 | 0 | 498 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 1000 | 0 | U557 | 1000 | 0 | 0 | 0 | 0 | 0 | 998 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 5000 | 0 | U558 | 5000 | 0 | 0 | 0 | 0 | 0 | 4998 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTGSS | 10000 | 0 | U559 | 10000 | 0 | 0 | 0 | 0 | 0 | 9998 | 0 | 0 | 0 | 0 | 0.1000000D+02 |
| TOINTPSP | 50 | 0 | U551 | 50 | 0 | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0.2255600D+03 |
| TOINTQOR | 50 | 0 | U550 | 50 | 0 | 0 | 0 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0.1175500D+04 |
| TORSIONA | 16 | 0 | U560 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.3086400D+00 |
| TORSIONA | 100 | 0 | U561 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.4057000D+00 |
| TORSIONA | 484 | 0 | U562 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.4161100D+00 |
| TORSIONA | 1024 | 0 | U563 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.4174000D+00 |
| TORSIONA | 5476 | 0 | U564 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.4183000D+00 |
| TORSIONA | 10000 | 0 | U565 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.4183900D+00 |
| TORSIONA | 14884 | 0 | U566 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.4184200D+00 |
| TORSIONB | 16 | 0 | U567 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.3086400D+00 |
| TORSIONB | 100 | 0 | U568 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.4057000D+00 |
| TORSIONB | 484 | 0 | U569 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.4161100D+00 |
| TORSIONB | 1024 | 0 | U570 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.4174000D+00 |
| TORSIONB | 5476 | 0 | U571 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.4183000D+00 |
| TORSIONB | 10000 | 0 | U572 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.4183900D+00 |
| TORSIONB | 14884 | 0 | U573 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.4184200D+00 |
| TORSIONC | 16 | 0 | U574 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.1037000D+01 |
| TORSIONC | 100 | 0 | U575 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.1176600D+01 |
| TORSIONC | 484 | 0 | U576 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.1199500D+01 |
| TORSIONC | 1024 | 0 | U577 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.1202300D+01 |
| TORSIONC | 5476 | 0 | U578 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.1204200D+01 |
| TORSIONC | 10000 | 0 | U579 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.1204400D+01 |
| TORSIONC | 14884 | 0 | U580 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.1204500D+01 |
| TORSIOND | 16 | 0 | U581 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.1037000D+01 |
| TORSIOND | 100 | 0 | U582 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.1176600D+01 |
| TORSIOND | 484 | 0 | U583 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.1199500D+01 |
| TORSIOND | 1024 | 0 | U584 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.1202300D+01 |
| TORSIOND | 5476 | 0 | U585 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.1204200D+01 |
| TORSIOND | 10000 | 0 | U586 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.1204400D+01 |
| TORSIOND | 14884 | 0 | U587 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.1204500D+01 |
| TORSIONE | 16 | 0 | U588 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.2518500D+01 |
| TORSIONE | 100 | 0 | U589 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.2798400D+01 |
| TORSIONE | 484 | 0 | U590 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.2840600D+01 |
| TORSIONE | 1024 | 0 | U591 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.2846100D+01 |
| TORSIONE | 5476 | 0 | U592 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.2850200D+01 |
| TORSIONE | 10000 | 0 | U593 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.2850700D+01 |
| TORSIONE | 14884 | 0 | U594 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.2850800D+01 |
| TORSIONF | 16 | 0 | U595 | 0 | 12 | 0 | 0 | 4 | 1 | 18 | 0 | 0 | 0 | 0 | -0.2518500D+01 |
| TORSIONF | 100 | 0 | U596 | 0 | 36 | 0 | 0 | 64 | 1 | 162 | 0 | 0 | 0 | 0 | -0.2798400D+01 |
| TORSIONF | 484 | 0 | U597 | 0 | 84 | 0 | 0 | 400 | 1 | 882 | 0 | 0 | 0 | 0 | -0.2840600D+01 |
| TORSIONF | 1024 | 0 | U598 | 0 | 124 | 0 | 0 | 900 | 1 | 1922 | 0 | 0 | 0 | 0 | -0.2846100D+01 |
| TORSIONF | 5476 | 0 | U599 | 0 | 292 | 0 | 0 | 5184 | 1 | 10658 | 0 | 0 | 0 | 0 | -0.2850200D+01 |
| TORSIONF | 10000 | 0 | U600 | 0 | 396 | 0 | 0 | 9604 | 1 | 19602 | 0 | 0 | 0 | 0 | -0.2850700D+01 |
| TORSIONF | 14884 | 0 | U601 | 0 | 484 | 0 | 0 | 14400 | 1 | 29282 | 0 | 0 | 0 | 0 | -0.2850800D+01 |
| TQUARTIC | 5 | 0 | U532 | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0.1232600D-31 |
| TQUARTIC | 10 | 0 | U533 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| TQUARTIC | 50 | 0 | U534 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| TQUARTIC | 100 | 0 | U535 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.3155400D-29 |
| TQUARTIC | 500 | 0 | U536 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.1232600D-31 |
| TQUARTIC | 1000 | 0 | U537 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.1970700D-27 |

Problem characteristics ( 14 )

| Problem | $n$ | $m$ | pbid | problem variables | | | | | objective function | | equality constraints | | inequality constraints | | best value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | $n_{fr}$ | $n_{fx}$ | $n_l$ | $n_u$ | $n_{lu}$ | $n_{lo}$ | $n_{no}$ | $n_{le}$ | $n_{ne}$ | $n_{li}$ | $n_{ni}$ | |
| TQUARTIC | 5000 | 0 | U538 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.9871100D-27 |
| TQUARTIC | 10000 | 0 | U539 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.3157300D-25 |
| TRIDIA | 10 | 0 | U540 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.3855800D-31 |
| TRIDIA | 20 | 0 | U541 | 20 | 0 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| TRIDIA | 30 | 0 | U542 | 30 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 0 | 0 | 0 | 0.1656300D-31 |
| TRIDIA | 50 | 0 | U543 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.2600000D-32 |
| TRIDIA | 100 | 0 | U544 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.1352000D-31 |
| TRIDIA | 500 | 0 | U545 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.4044500D-32 |
| TRIDIA | 1000 | 0 | U546 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.1155600D-32 |
| TRIDIA | 5000 | 0 | U547 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.4188900D-32 |
| TRIDIA | 10000 | 0 | U548 | 10000 | 0 | 0 | 0 | 0 | 0 | 10000 | 0 | 0 | 0 | 0 | 0.5345100D-32 |
| TRIGGER | 7 | 6 | U552 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0.2659900D-15 |
| VARDIM | 10 | 0 | U602 | 10 | 0 | 0 | 0 | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0.1595000D-25 |
| VARDIM | 50 | 0 | U603 | 50 | 0 | 0 | 0 | 0 | 0 | 52 | 0 | 0 | 0 | 0 | 0.1264100D-26 |
| VARDIM | 100 | 0 | U604 | 100 | 0 | 0 | 0 | 0 | 0 | 102 | 0 | 0 | 0 | 0 | 0.5171000D-25 |
| VAREIGVL | 10 | 0 | U605 | 10 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0.1453800D-10 |
| VAREIGVL | 50 | 0 | U606 | 50 | 0 | 0 | 0 | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 0.5898000D-10 |
| VAREIGVL | 100 | 0 | U607 | 100 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0.6576900D-10 |
| VAREIGVL | 500 | 0 | U608 | 500 | 0 | 0 | 0 | 0 | 0 | 500 | 0 | 0 | 0 | 0 | 0.1794800D-09 |
| VAREIGVL | 1000 | 0 | U609 | 1000 | 0 | 0 | 0 | 0 | 0 | 1000 | 0 | 0 | 0 | 0 | 0.6378700D-11 |
| VAREIGVL | 5000 | 0 | U610 | 5000 | 0 | 0 | 0 | 0 | 0 | 5000 | 0 | 0 | 0 | 0 | 0.7193100D-09 |
| WATSON | 12 | 0 | U611 | 12 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0.2892700D-09 |
| WATSON | 31 | 0 | U612 | 31 | 0 | 0 | 0 | 0 | 0 | 31 | 0 | 0 | 0 | 0 | 0.2639500D-09 |
| WOODS | 4 | 0 | U613 | 4 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0.1789900D-21 |
| WOODS | 100 | 0 | U614 | 100 | 0 | 0 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0.1544300D-21 |
| WOODS | 1000 | 0 | U615 | 1000 | 0 | 0 | 0 | 0 | 0 | 1500 | 0 | 0 | 0 | 0 | 0.3982000D-19 |
| WOODS | 10000 | 0 | U616 | 10000 | 0 | 0 | 0 | 0 | 0 | 15000 | 0 | 0 | 0 | 0 | 0.3982000D-18 |
| ZANGWIL2 | 2 | 0 | U617 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | -0.1820000D+02 |
| ZANGWIL3 | 3 | 0 | U618 | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0.0000000D+00 |
| ZIGZAG | 64 | 50 | C294 | 28 | 6 | 0 | 0 | 30 | 0 | 10 | 40 | 0 | 0 | 10 | 0.1800000D+01 |
| ZIGZAG | 304 | 250 | C295 | 148 | 6 | 0 | 0 | 150 | 0 | 50 | 200 | 0 | 0 | 50 | 0.3378700D+02 |
| ZIGZAG | 604 | 500 | C296 | 298 | 6 | 0 | 0 | 300 | 0 | 100 | 400 | 0 | 0 | 100 | 0.5230500D+02 |
| ZIGZAG | 3004 | 2500 | C297 | 1498 | 6 | 0 | 0 | 1500 | 0 | 500 | 2000 | 0 | 0 | 500 | 0.8639500D+02 |

Problem characteristics ( 15 )

# 3 Number of minor iterations

This section presents the number of minor iterations required by the twenty one algorithmic variants of LANCELOT described in [3] for convergence. The column headings in the tables refer to these variants, using the terminology of the paper.

The following additional conventions were used.

- "—E—" means that the run was terminated on an arithmetic error,
- "—M—" means that the run was abandoned because it required too large a workspace (over three million integers and/or double precision numbers),
- "—F—" means that the calculation was terminated because no feasible point could be found for the problem by the considered algorithmic variant,
- "—I—" means that the calculation was terminated because the maximum number of iterations (1000) was reached without convergence,
- "—S—" means that the considered run was stopped because the step was comparable to machine precision,
- "—T—" means that the considered run was terminated without convergence after 18000 seconds of cpu-time on a DECstation 5000/200.

These five termination cases are considered as unsuccessful for the corresponding problem and variant.

Brackets around numbers indicate that the algorithmic variant terminate successfully, but at a point where the objective value was different (with a relative tolerance of 0.01%) from the "best value" reported in Section 2. The number between the brackets indicate the relevant statistic for this successfully terminated run.

Number of minor iterations ( 1 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGG | 163 | 488 | —T— | —T— | —I— | —I— | —T— | —I— | —S— | —S— | —T— | —I— | —S— | —I— | —T— | —S— | —I— | —S— | —T— | —T— | —T— | —T— | —T— |
| AIRCRFTA | 8 | 5 | 4 | 4 | 4 | 4 | 4 | 42 | 5 | 5 | 4 | 4 | 16 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 |
| AIRCRFTB | 8 | 0 | 18 | 18 | 17 | 17 | 20 | 11 | 22 | 19 | 18 | 19 | 17 | 17 | 17 | 10 | 15 | 20 | 20 | —S— | 17 | 18 | 19 |
| ALJAZZAF | 3 | 1 | 23 | 23 | 24 | 24 | 24 | —I— | 24 | 23 | 23 | 24 | 23 | 23 | 23 | 23 | 23 | 23 | 31 | —I— | 31 | 31 | 32 |
| ARGAUSS | 3 | 0 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINA | 10 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINA | 100 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINB | 10 | 0 | 1 | 1 | 1 | 1 | 1 | 417 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARGLINB | 50 | 0 | 2 | —S— | 2 | 2 | 2 | —I— | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINB | 100 | 0 | 2 | —S— | 2 | 2 | 2 | —I— | 2 | 2 | 2 | 2 | 2 | 7 | 2 | —S— | —S— | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINC | 10 | 0 | 1 | 1 | 1 | 1 | 1 | 357 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARGLINC | 50 | 0 | 2 | —S— | 2 | 2 | 2 | —I— | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINC | 100 | 0 | 2 | —S— | 2 | 2 | 2 | —I— | 2 | 2 | 2 | 2 | 2 | 10 | 2 | —S— | —S— | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGTRIG | 10 | 0 | 8 | 8 | 11 | 7 | 11 | 17 | 8 | 9 | 9 | 7 | 9 | 7 | 8 | 7 | 6 | 7 | 5 | 5 | 8 | 8 | 8 |
| ARGTRIG | 50 | 0 | 8 | 8 | 13 | 4 | 6 | 13 | 18 | 18 | 6 | 6 | 4 | 5 | 7 | 8 | 14 | 6 | 5 | 5 | 6 | 6 | 6 |
| ARGTRIG | 100 | 0 | 13 | 13 | 8 | 4 | 6 | 10 | 16 | 21 | 11 | 5 | 4 | 5 | 6 | 13 | 14 | 7 | 5 | 5 | 5 | 5 | 5 |
| ARTIF | 12 | 0 | 14 | 9 | 16 | 13 | 14 | 15 | 15 | 14 | 14 | 15 | 13 | 15 | 15 | 16 | 18 | 13 | 6 | 6 | 8 | 8 | 8 |
| ARTIF | 52 | 0 | 20 | 23 | 26 | 18 | 36 | 18 | 22 | 20 | 20 | 26 | 25 | 26 | 29 | 17 | 25 | 19 | 13 | 13 | 12 | 12 | 12 |
| ARTIF | 102 | 0 | 33 | 42 | 39 | 22 | 191 | 108 | 28 | 32 | 33 | 55 | 43 | 55 | 32 | 37 | 34 | 22 | 37 | 37 | 22 | 22 | 22 |
| ARTIF | 502 | 0 | 33 | 39 | 85 | 23 | 43 | 53 | 29 | 33 | 33 | 56 | 44 | 56 | 34 | 29 | 31 | 24 | 44 | 44 | 22 | 22 | 22 |
| ARTIF | 1002 | 0 | 33 | 42 | 140 | 23 | 44 | 63 | 29 | 33 | 33 | 47 | 45 | 47 | 34 | 29 | 26 | 24 | 41 | 41 | 22 | 22 | 22 |
| ARTIF | 5002 | 0 | 33 | 46 | 316 | —T— | 43 | 68 | 29 | 33 | 33 | 66 | 43 | 66 | 33 | 33 | 39 | 24 | 43 | 43 | 21 | 21 | 21 |
| ARWHEAD | 100 | 0 | 5 | 5 | 5 | 5 | 5 | 29 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 |
| ARWHEAD | 500 | 0 | 5 | 5 | 5 | 5 | 5 | 61 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 12 |
| ARWHEAD | 1000 | 0 | 5 | 5 | 5 | 5 | 5 | 85 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| ARWHEAD | 5000 | 0 | 5 | 5 | 5 | 5 | 5 | 188 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 |
| BARD | 3 | 0 | 7 | 8 | 12 | 9 | 13 | 9 | 13 | 12 | 7 | 12 | 10 | 8 | 12 | 7 | 7 | 7 | 11 | —I— | 8 | 9 | 9 |
| BDEXP | 100 | 0 | 10 | 10 | 10 | 10 | 10 | 14 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | 10 | 17 | 18 | 16 | 23 | 23 |
| BDEXP | 500 | 0 | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | 11 | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 13) | ( 10) | 17 | 18 | ( 16) | 28 | ( 26) |
| BDEXP | 1000 | 0 | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | 11 | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 14) | ( 10) | ( 17) | 18 | ( 16) | ( 26) | ( 25) |
| BDEXP | 5000 | 0 | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 11) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 10) | ( 15) | ( 10) | ( 17) | 18 | ( 16) | ( 26) | ( 27) |
| BDQRTIC | 100 | 0 | 11 | 8 | 11 | 11 | 12 | 101 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 10 |
| BDQRTIC | 500 | 0 | 11 | 10 | 11 | 11 | 12 | 222 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 11 | 10 | 10 | 10 | 10 | 14 |
| BDQRTIC | 1000 | 0 | 11 | 10 | 37 | 37 | 12 | 313 | 12 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 11 | 11 | 11 | 11 | 11 | —S— |
| BDVALUE | 12 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BDVALUE | 52 | 0 | 1 | 1 | 1 | 1 | 10 | 7 | 6 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 102 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 502 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 1002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BDVALUE | 5002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BEALE | 2 | 0 | 7 | —E— | 7 | 7 | 5 | 127 | 9 | 7 | 7 | 9 | 7 | 7 | 8 | 7 | 7 | 7 | 15 | 16 | 12 | 13 | 13 |
| BIGBANK | 2230 | 1112 | —T— | —T— | 133 | 25 | —T— | —I— | —T— | —T— | —T— | —T— | 39 | 39 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| BIGGS3 | 6 | 0 | 11 | 10 | 11 | 11 | 11 | 9 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 18 | —S— | 11 | 16 | 16 |
| BIGGS5 | 6 | 0 | 48 | 53 | —I— | 34 | 19 | 35 | 46 | ( 49) | 48 | 33 | 39 | 57 | 46 | 48 | 51 | 45 | 44 | —I— | ( 262) | 34 | 40 |
| BIGGS6 | 6 | 0 | 111 | 50 | 219 | 69 | 23 | —I— | 55 | 26 | 111 | 37 | 124 | 86 | ( 84) | 91 | 82 | 107 | ( 160) | —I— | 86 | 55 | 83 |
| BOOTH | 2 | 0 | 3 | 3 | 3 | 3 | 2 | 10 | 5 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BOX2 | 3 | 0 | 6 | 21 | 5 | 5 | 5 | 23 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| BOX3 | 3 | 0 | 7 | 17 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 8 |
| BQPGAUSS | 2003 | 0 | 8 | —S— | —I— | 8 | 7 | 8 | 11 | 12 | 10 | 213 | 7 | 7 | 7 | 9 | 10 | 7 | —I— | —S— | 53 | 19 | —I— |
| BRATU1D | 13 | 0 | 5 | 5 | 5 | 5 | 6 | 13 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | —S— | —S— | 15 | 12 | 441 |
| BRATU1D | 77 | 0 | 7 | 7 | 7 | 7 | 8 | 187 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 7 | —I— | —I— | 17 | 14 | —I— |
| BRATU1D | 103 | 0 | 8 | 7 | 8 | 8 | 9 | —I— | 10 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | —I— | —I— | 15 | 13 | —I— |
| BRATU1D | 503 | 0 | 10 | 8 | 10 | —E— | 12 | —I— | 14 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 13 | 10 | —E— | —I— | —E— | 14 | —E— |
| BRATU1D | 1003 | 0 | 11 | —E— | 11 | 11 | 13 | —I— | 15 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 15 | 11 | —E— | —I— | —E— | 15 | —E— |
| BRATU2D | 49 | 25 | 4 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| BRATU2D | 100 | 64 | 3 | 4 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| BRATU2D | 484 | 400 | 3 | 5 | 2 | 2 | 2 | 4 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| BRATU2D | 1024 | 900 | 2 | 5 | 2 | 2 | 2 | 4 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| BRATU2D | 5184 | 4900 | 2 | 5 | —F— | —F— | —F— | 4 | 2 | 2 | 2 | —F— | —F— | —F— | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |

Number of minor iterations ( 2 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRATU3D | 27 | 1 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| BRATU3D | 125 | 27 | 4 | 4 | 4 | 4 | 4 | 7 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| BRATU3D | 512 | 216 | 4 | 4 | 3 | 3 | 3 | 7 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| BRATU3D | 1000 | 512 | 3 | 4 | 3 | 3 | 3 | 7 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 6 | 4 | 3 | 3 | 3 | 3 | 4 |
| BRATU3D | 4913 | 3375 | 3 | 5 | 3 | 3 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 7 | 4 | 3 | 3 | 3 | 3 | 3 |
| BRIDGEND | 2734 | 2727 | —T— | —I— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —I— | —T— | 222 | —T— | —T— | —T— | —T— | —I— | —I— | —T— | —T— | —I— |
| BRITGAS | 450 | 360 | 111 | 125 | —I— | —I— | 70 | 48 | 65 | 103 | 98 | 467 | 177 | 56 | 79 | 116 | 107 | 58 | —I— | —I— | 113 | 161 | —I— |
| BRKMCC | 2 | 0 | 3 | 4 | 3 | 3 | 4 | 6 | 4 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BROWNAL | 10 | 0 | 5 | 5 | 4 | 4 | 4 | 10 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 5 | 8 | 6 | 5 | 5 | 5 | 5 | 5 |
| BROWNAL | 50 | 0 | 3 | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| BROWNBS | 2 | 0 | 34 | 34 | —I— | —I— | 24 | 45 | 22 | 34 | 34 | 22 | 39 | 38 | 39 | 34 | 37 | 29 | 76 | —I— | 41 | 34 | 33 |
| BROWNDEN | 4 | 0 | 11 | 11 | 77 | 81 | 11 | —I— | 13 | 13 | 11 | 12 | 11 | 11 | 11 | 11 | 10 | 11 | 14 | 69 | 13 | 11 | —I— |
| BROYDN3D | 10 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 50 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 100 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 500 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 1000 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 5000 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 10000 | 0 | 5 | 5 | 5 | 5 | 5 | 8 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 5 | 4 | 4 | 7 | 7 | 7 |
| BROYDN7D | 10 | 0 | 16 | 16 | ( 21) | 18 | 21 | ( 29) | ( 18) | 18 | 16 | 23 | 18 | ( 16) | ( 19) | 22 | 21 | 18 | ( 53) | ( 53) | 23 | 23 | 23 |
| BROYDN7D | 50 | 0 | ( 26) | ( 26) | ( 41) | ( 14) | ( 19) | ( 22) | ( 18) | 29 | ( 26) | ( 27) | ( 19) | ( 28) | ( 29) | ( 21) | ( 21) | ( 13) | ( 52) | ( 52) | ( 24) | ( 24) | ( 24) |
| BROYDN7D | 100 | 0 | ( 27) | ( 27) | ( 48) | ( 13) | ( 21) | ( 27) | ( 23) | 43 | ( 27) | ( 41) | ( 26) | ( 41) | ( 41) | ( 30) | ( 43) | ( 14) | ( 62) | ( 62) | ( 31) | ( 31) | ( 31) |
| BROYDN7D | 500 | 0 | ( 78) | ( 78) | ( 108) | ( 13) | ( 81) | ( 101) | ( 88) | 58 | ( 78) | ( 122) | ( 32) | ( 110) | ( 113) | ( 67) | ( 71) | ( 16) | ( 126) | ( 126) | ( 55) | ( 55) | ( 65) |
| BROYDN7D | 1000 | 0 | ( 124) | ( 124) | ( 146) | ( 15) | ( 136) | ( 220) | ( 153) | 58 | ( 124) | ( 202) | ( 39) | ( 89) | ( 27) | ( 120) | ( 127) | ( 15) | ( 221) | ( 221) | ( 107) | ( 111) | ( 109) |
| BROYDNBD | 10 | 10 | 11 | 18 | 13 | 12 | 11 | 18 | 12 | 12 | 11 | 11 | 12 | 12 | 12 | 11 | 10 | 12 | 12 | 12 | 12 | 12 | 12 |
| BROYDNBD | 50 | 50 | 12 | 12 | 19 | 13 | 10 | 18 | 12 | 9 | 11 | 15 | 15 | 15 | 15 | 12 | 14 | 11 | 15 | 15 | 15 | 15 | 15 |
| BROYDNBD | 100 | 100 | 12 | 12 | 18 | 10 | 10 | 18 | 9 | 11 | 14 | 17 | 13 | 17 | 13 | 12 | 12 | 11 | 12 | 12 | 12 | 12 | 12 |
| BROYDNBD | 500 | 500 | 15 | 15 | 25 | 13 | 10 | 18 | 12 | 10 | 14 | 18 | 10 | 18 | 15 | 12 | 15 | 11 | 14 | 14 | 14 | 14 | 14 |
| BROYDNBD | 1000 | 1000 | 16 | 16 | 33 | 12 | 13 | 18 | 12 | 12 | 14 | 33 | 11 | 33 | 16 | 14 | 13 | 12 | 14 | 14 | 14 | 14 | 14 |
| BROYDNBD | 5000 | 5000 | 31 | 31 | 21 | 16 | 18 | 18 | 8 | 13 | 25 | 42 | 12 | 42 | 20 | —F— | 47 | 12 | 13 | 13 | 13 | 13 | 13 |
| CBRATU2D | 32 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU2D | 98 | 50 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU2D | 512 | 392 | 3 | 4 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| CBRATU2D | 1058 | 882 | 3 | 5 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| CBRATU3D | 54 | 2 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU3D | 128 | 16 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU3D | 686 | 250 | 4 | 4 | 4 | 4 | 4 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU3D | 2000 | 1024 | 3 | 4 | 3 | 3 | 3 | 7 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 6 | 4 | 3 | 3 | 3 | 3 | 3 |
| CHANDHEQ | 10 | 0 | 13 | 13 | 12 | 12 | 12 | 13 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 |
| CHANDHEQ | 50 | 0 | 13 | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 |
| CHANDHEQ | 100 | 0 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | 14 |
| CHEBYQAD | 2 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 5 | 5 | 5 | 5 | 5 |
| CHEBYQAD | 4 | 0 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 8 | 8 | 8 | 8 | 7 | 10 | 7 | 7 | 7 | 7 | 7 | 8 |
| CHEBYQAD | 5 | 0 | 7 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| CHEBYQAD | 6 | 0 | 13 | 13 | 13 | 9 | 8 | 8 | 11 | 12 | 13 | 12 | 11 | 10 | 14 | 13 | 12 | 11 | 7 | 7 | 12 | 12 | 12 |
| CHEBYQAD | 7 | 0 | 10 | 17 | 15 | 10 | 9 | 8 | 10 | 10 | 10 | 9 | 13 | 11 | 12 | 11 | 10 | 9 | 20 | 20 | 14 | 14 | 14 |
| CHEBYQAD | 8 | 0 | 22 | 22 | 24 | 20 | 12 | 14 | 13 | 14 | 24 | 22 | 16 | 22 | 22 | 23 | 20 | 16 | 60 | 60 | 11 | 11 | 11 |
| CHEBYQAD | 9 | 0 | 18 | 26 | 22 | 12 | 10 | 13 | 10 | 9 | 14 | 8 | 17 | 21 | 13 | 18 | 16 | 13 | 29 | 29 | 21 | 21 | 21 |
| CHEBYQAD | 10 | 0 | 20 | 20 | ( 26) | 19 | ( 13) | ( 17) | ( 13) | ( 14) | 17 | 25 | 16 | 17 | 19 | 20 | 14 | ( 16) | 118 | 118 | 20 | 20 | 20 |
| CHEBYQAD | 20 | 0 | 29 | 29 | 57 | 24 | 20 | 101 | 15 | 26 | 26 | 62 | 29 | 29 | 40 | 25 | 27 | 26 | 86 | 88 | 28 | 28 | 27 |
| CHEBYQAD | 50 | 0 | 58 | 83 | 158 | 901 | 30 | 84 | 30 | 43 | 56 | 152 | 69 | 95 | 155 | 56 | 53 | 32 | —I— | —I— | 50 | 50 | 50 |
| CHEMRCTA | 10 | 10 | 9 | 7 | 7 | 6 | 6 | 72 | 8 | 13 | 6 | 7 | 6 | 6 | 6 | 9 | 9 | 7 | 9 | 10 | 9 | 9 | 9 |
| CHEMRCTA | 50 | 50 | 19 | 10 | 20 | 19 | —F— | —F— | —F— | 239 | 25 | 15 | 40 | 22 | —F— | 19 | 24 | 18 | 26 | 18 | 13 | 20 | 20 |
| CHEMRCTA | 100 | 100 | 53 | 40 | 804 | 33 | —F— | —F— | —F— | —S— | 50 | 24 | —F— | 50 | —F— | 51 | 48 | 51 | 24 | 27 | 23 | 25 | 25 |
| CHEMRCTA | 500 | 500 | —T— | —F— | —F— | —F— | —T— | —F— | —T— | —T— | —T— | 161 | —F— | 130 | —T— | —F— | —F— | —T— | —E— | —T— | —F— | —F— | —T— |
| CHEMRCTA | 1000 | 1000 | —T— | —F— | —F— | —F— | —T— | —T— | —T— | —T— | —T— | 297 | 959 | 270 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTA | 5000 | 5000 | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTB | 10 | 10 | 8 | 8 | 8 | 9 | 10 | —F— | 31 | 21 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 13 | 7 | 13 | 13 | 13 |
| CHEMRCTB | 50 | 50 | 20 | 54 | 24 | —F— | —F— | —F— | —F— | 554 | 20 | 24 | 31 | 24 | 72 | 20 | 16 | 15 | 22 | 20 | 22 | 22 | 22 |

Number of minor iterations ( 3 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMRCTB | 100 | 100 | 20 | 29 | 42 | 61 | —F— | —F— | —F— | —S— | 20 | 42 | 42 | 42 | —F— | 20 | 27 | 19 | 28 | 31 | 28 | 28 | 28 |
| CHEMRCTB | 500 | 500 | 70 | 72 | 154 | —F— | —T— | —T— | —T— | —T— | 70 | 154 | 154 | 154 | —F— | 70 | 67 | 70 | 72 | 72 | 72 | 72 | 69 |
| CHEMRCTB | 1000 | 1000 | 119 | —S— | 416 | —F— | —T— | —T— | —T— | —T— | 119 | 285 | 314 | 285 | —F— | 120 | 122 | 115 | —S— | —S— | —S— | —S— | —S— |
| CHNROSNB | 10 | 0 | 29 | 32 | 29 | 29 | 36 | 53 | 32 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 33 | 25 | 35 | 35 | 28 | 28 | 28 |
| CHNROSNB | 25 | 0 | 44 | 40 | 49 | 39 | 52 | 730 | 60 | 44 | 44 | 56 | 50 | 56 | 52 | 44 | 48 | 38 | 63 | 63 | 43 | 43 | 43 |
| CHNROSNB | 50 | 0 | 76 | 71 | 77 | 61 | 78 | 116 | 74 | 76 | 76 | 76 | 80 | 76 | 83 | 76 | 74 | 69 | 92 | 92 | 69 | 69 | 60 |
| CLIFF | 2 | 0 | 27 | 27 | 27 | 27 | 28 | —I— | 28 | 27 | 27 | 29 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 |
| CLPLATEA | 16 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEA | 49 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEA | 100 | 0 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEA | 529 | 0 | 5 | 13 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CLPLATEA | 1024 | 0 | 6 | 15 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| CLPLATEA | 5041 | 0 | 8 | 17 | 14 | 6 | 7 | 11 | 7 | 8 | 8 | 14 | 14 | 14 | 15 | 12 | 16 | 6 | 8 | 8 | 8 | 8 | 8 |
| CLPLATEB | 16 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 49 | 0 | 2 | 4 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEB | 100 | 0 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEB | 529 | 0 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEB | 1024 | 0 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEB | 5041 | 0 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEC | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEC | 49 | 0 | 3 | 4 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEC | 100 | 0 | 3 | 4 | 1 | 1 | 2 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEC | 529 | 0 | 4 | 4 | 1 | 1 | 2 | 5 | 3 | 4 | 4 | 1 | 1 | 1 | 2 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEC | 1024 | 0 | 4 | 4 | 1 | 1 | 2 | 6 | 4 | 4 | 4 | 1 | 1 | 1 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEC | 5041 | 0 | 3 | 4 | 1 | 1 | 2 | 13 | 4 | 3 | 3 | 1 | 1 | 1 | 3 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLUSTER | 2 | 2 | 11 | 11 | 11 | 11 | 9 | 9 | 9 | 11 | 11 | 9 | 11 | 11 | 5 | 11 | 11 | 9 | 12 | 20 | 13 | 12 | 12 |
| CORKSCRW | 96 | 70 | 39 | 39 | 276 | 62 | 34 | 55 | 42 | 46 | 44 | 33 | 61 | 41 | 71 | 41 | 36 | 39 | 47 | 476 | 42 | 70 | 78 |
| CORKSCRW | 456 | 350 | 128 | 160 | —I— | 92 | —T— | 635 | 143 | 148 | 126 | 106 | 85 | 76 | 95 | 129 | 128 | 92 | 268 | —I— | 147 | 194 | 177 |
| CORKSCRW | 906 | 700 | —T— | 350 | —I— | —I— | —T— | —I— | —T— | —T— | —S— | 123 | —S— | 113 | 123 | —T— | —T— | —T— | —T— | —I— | —T— | —T— | —T— |
| CORKSCRW | 4506 | 3500 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CORKSCRW | 9006 | 7000 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CRAGGLVY | 4 | 0 | 16 | 20 | 16 | 16 | 17 | 34 | 17 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 |
| CRAGGLVY | 10 | 0 | 14 | 15 | 14 | 14 | 14 | 55 | 16 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 13 | 14 | 14 | 13 | 14 | 14 | 14 |
| CRAGGLVY | 50 | 0 | 14 | 14 | 14 | 14 | 13 | 55 | 16 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| CRAGGLVY | 100 | 0 | 14 | 14 | 14 | 14 | 13 | 55 | 16 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| CRAGGLVY | 500 | 0 | 14 | 15 | 14 | 14 | 13 | 55 | 16 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 15 | 14 | 14 | 14 | 14 | 14 | 14 |
| CRAGGLVY | 1000 | 0 | 14 | 15 | 14 | 14 | 13 | 43 | 16 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 15 | 14 | 14 | 14 | 14 | 14 | 19 |
| CRAGGLVY | 5000 | 0 | 14 | 15 | 14 | 14 | 13 | 39 | 15 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 16 | 14 | 14 | 14 | 14 | 14 | —S— |
| CUBE | 2 | 0 | 36 | 67 | 31 | 33 | 42 | 488 | 47 | 36 | 36 | 47 | 48 | 46 | 45 | 36 | 46 | 47 | 41 | 29 | 32 | 32 | 32 |
| DALLASL | 906 | 667 | 91 | —T— | 430 | 45 | 119 | —I— | 110 | 110 | 82 | 66 | 47 | 47 | 84 | 84 | 97 | 67 | 93 | —I— | 93 | 118 | ( 159) |
| DALLASM | 196 | 151 | 83 | —I— | 42 | 48 | 336 | —I— | 382 | 190 | 74 | 63 | 42 | 42 | 79 | 82 | 87 | 66 | 88 | —I— | 87 | 87 | 85 |
| DALLASS | 46 | 31 | 79 | —S— | 42 | 42 | 97 | —I— | 107 | 124 | 93 | 63 | 41 | 41 | 62 | 88 | 87 | 59 | 90 | —I— | 90 | 93 | 119 |
| DEGENLPA | 20 | 15 | 25 | 20 | —I— | 21 | 116 | —I— | 39 | 44 | 18 | 40 | 22 | 20 | 45 | —S— | 26 | —S— | 29 | —S— | 28 | 29 | 28 |
| DEGENLPB | 20 | 15 | —S— | —S— | —I— | 16 | 149 | —I— | —S— | 43 | —S— | 35 | —S— | 17 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| DENSCHNA | 2 | 0 | 5 | 5 | 5 | 5 | 5 | 7 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| DENSCHNB | 2 | 0 | 3 | 3 | 3 | 3 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 2 | 2 | 2 | 2 | 2 |
| DENSCHNC | 2 | 0 | 9 | 11 | 9 | 9 | 9 | 50 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 9 | 9 | 9 |
| DENSCHND | 3 | 0 | 33 | 40 | 45 | 64 | 28 | —I— | 32 | 33 | 33 | 31 | 41 | 37 | 54 | 35 | 32 | 30 | 42 | —I— | 36 | 35 | 36 |
| DENSCHNE | 3 | 0 | 11 | —E— | 11 | 12 | 16 | 21 | 11 | 11 | 11 | 10 | 10 | 10 | 14 | 12 | 15 | 11 | 11 | 10 | 11 | 11 | 11 |
| DENSCHNF | 2 | 0 | 6 | 6 | 6 | 6 | 6 | 32 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| DIPIGRI | 7 | 4 | 60 | 57 | 37 | 21 | 29 | 503 | 40 | 54 | 37 | 41 | 33 | 31 | 49 | 58 | 281 | 35 | 56 | —I— | 45 | 68 | —I— |
| DISC2 | 29 | 23 | 72 | 66 | —I— | 139 | 79 | 266 | 70 | 108 | 177 | 91 | 82 | 82 | 156 | 83 | 75 | 82 | 112 | —I— | 80 | 78 | 89 |
| DISCS | 36 | 66 | 715 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —F— | ( 245) | —I— | ( 384) | —F— | —I— | —T— | 408 | 280 | 710 | 709 | —I— |
| DIXCHLNG | 10 | 5 | 36 | 44 | 40 | 23 | 29 | 570 | 33 | ( 63) | 31 | 37 | 36 | 29 | 30 | 43 | 34 | 36 | 79 | —I— | 30 | 34 | ( 369) |
| DIXCHLNV | 10 | 5 | 15 | 51 | 11 | 12 | 20 | 563 | 18 | 13 | 11 | 14 | 12 | 14 | 35 | 44 | 22 | 14 | 24 | —I— | 48 | 26 | 26 |
| DIXMAANA | 15 | 0 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 12 | 2 | 6 | 6 | 27 |
| DIXMAANA | 90 | 0 | 5 | 5 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 6 | 6 | 11 | 2 | 12 | 7 | 2 |
| DIXMAANA | 300 | 0 | 5 | 5 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 7 | 7 | 11 | 2 | 11 | 7 | 2 |
| DIXMAANA | 1500 | 0 | 5 | 5 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 8 | 6 | 12 | 2 | 11 | 7 | 2 |

Number of minor iterations ( 4 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXMAANA | 3000 | 0 | 5 | 5 | 5 | 6 | 4 | 6 | 5 | 5 | 5 | 5 | 4 | 5 | 5 | 5 | 8 | 6 | 12 | 2 | 11 | 7 | 2 |
| DIXMAANB | 15 | 0 | 6 | 6 | 6 | 5 | 6 | 9 | 7 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 8 | 7 | 9 | 2 | 19 | 9 | 32 |
| DIXMAANB | 90 | 0 | 8 | 8 | 9 | 6 | 6 | 9 | 6 | 8 | 8 | 7 | 6 | 7 | 6 | 8 | 9 | 8 | 9 | 2 | 15 | 8 | 22 |
| DIXMAANB | 300 | 0 | 7 | 7 | 6 | 6 | 6 | 9 | 6 | 7 | 7 | 12 | 6 | 10 | 6 | 7 | 9 | 8 | 9 | 2 | 16 | 9 | 22 |
| DIXMAANB | 1500 | 0 | 7 | 7 | 7 | 6 | 6 | 9 | 6 | 7 | 7 | 7 | 6 | 12 | 6 | 7 | 10 | 8 | 9 | 2 | 15 | 8 | 22 |
| DIXMAANB | 3000 | 0 | 7 | 7 | 6 | 6 | 6 | 9 | 6 | 7 | 7 | 7 | 6 | 10 | 6 | 7 | 14 | 8 | 9 | 2 | 15 | 8 | 22 |
| DIXMAANC | 15 | 0 | 9 | 9 | 7 | 6 | 7 | 11 | 8 | 10 | 9 | 9 | 7 | 9 | 11 | 9 | 10 | 7 | 14 | 2 | 26 | 9 | 30 |
| DIXMAANC | 90 | 0 | 9 | 9 | 10 | 10 | 7 | 11 | 7 | 9 | 9 | 8 | 8 | 8 | 8 | 9 | 13 | 11 | 13 | 2 | 26 | 9 | 15 |
| DIXMAANC | 300 | 0 | 11 | 11 | 9 | 10 | 7 | 11 | 7 | 11 | 11 | 8 | 9 | 10 | 9 | 11 | 14 | 10 | 12 | 2 | 27 | 9 | 15 |
| DIXMAANC | 1500 | 0 | 17 | 17 | 11 | 10 | 7 | 11 | 7 | 17 | 17 | 15 | 9 | 15 | 11 | 13 | 13 | 11 | 12 | 2 | 23 | 9 | 15 |
| DIXMAANC | 3000 | 0 | 14 | 14 | 19 | 10 | 7 | 11 | 7 | 14 | 14 | 15 | 9 | 11 | 11 | 13 | 14 | 11 | 12 | 2 | 26 | 9 | 15 |
| DIXMAAND | 15 | 0 | 9 | 14 | 9 | 11 | 8 | 13 | 8 | 12 | 9 | 12 | 9 | 10 | 12 | 9 | 10 | 11 | 14 | 2 | 42 | 12 | 34 |
| DIXMAAND | 90 | 0 | 10 | 19 | 9 | 11 | 8 | 13 | 8 | 10 | 10 | 11 | 14 | 9 | 11 | 11 | 14 | 12 | 18 | 2 | 31 | 11 | 21 |
| DIXMAAND | 300 | 0 | 10 | 24 | 9 | 11 | 8 | 13 | 8 | 10 | 10 | 13 | 12 | 13 | 21 | 10 | 15 | 12 | 20 | 2 | 31 | 10 | 21 |
| DIXMAAND | 1500 | 0 | 9 | 23 | 12 | 11 | 8 | 13 | 8 | 9 | 9 | 16 | 13 | 16 | 13 | 9 | 15 | 12 | 26 | 2 | 35 | 11 | 21 |
| DIXMAAND | 3000 | 0 | 11 | 13 | 12 | 11 | 8 | 13 | 8 | 11 | 11 | 10 | 15 | 15 | 23 | 12 | 15 | 11 | 29 | 2 | 34 | 10 | 21 |
| DIXMAANE | 15 | 0 | 6 | 8 | 6 | 6 | 7 | 8 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 6 | 8 | 9 | 2 | 17 | 9 | 29 |
| DIXMAANE | 90 | 0 | 6 | 13 | 11 | 8 | 8 | 10 | 6 | 6 | 6 | 6 | 5 | 6 | 5 | 6 | 11 | 9 | 11 | 2 | 50 | 10 | 33 |
| DIXMAANE | 300 | 0 | 6 | 12 | 8 | 8 | 8 | 10 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 8 | 9 | 52 | 2 | 62 | 13 | 85 |
| DIXMAANE | 1500 | 0 | 6 | 12 | 8 | 8 | 8 | 11 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 13 | 9 | 36 | 2 | 74 | 20 | 188 |
| DIXMAANE | 3000 | 0 | 6 | 13 | 9 | 8 | 8 | 11 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 16 | 9 | 52 | 2 | 70 | 17 | 261 |
| DIXMAANF | 15 | 0 | 10 | 6 | 10 | 11 | 10 | 9 | 8 | 9 | 10 | 12 | 10 | 9 | 9 | 10 | 8 | 10 | 11 | 2 | 41 | 10 | 32 |
| DIXMAANF | 90 | 0 | 10 | 26 | 12 | 15 | 13 | 10 | 11 | 10 | 10 | 14 | 11 | 13 | 12 | 10 | 25 | 12 | 19 | 2 | 199 | 16 | 24 |
| DIXMAANF | 300 | 0 | 19 | 16 | 22 | 14 | 14 | 12 | 12 | 19 | 19 | 16 | 20 | 14 | 18 | 11 | 18 | 14 | 20 | 2 | 340 | 16 | 75 |
| DIXMAANF | 1500 | 0 | 25 | 20 | 23 | 19 | 16 | 22 | 15 | 25 | 25 | 26 | 24 | 19 | 37 | 37 | 50 | 18 | 29 | 2 | 418 | 24 | 265 |
| DIXMAANF | 3000 | 0 | 26 | 89 | 19 | 17 | 16 | 20 | 19 | 26 | 26 | 32 | 25 | 36 | 11 | 45 | 25 | 20 | 31 | 2 | 46 | 17 | 462 |
| DIXMAANG | 15 | 0 | 11 | 14 | 11 | 12 | 11 | 11 | 8 | 9 | 11 | 9 | 13 | 10 | 14 | 11 | 12 | 13 | 20 | 2 | 48 | 12 | 33 |
| DIXMAANG | 90 | 0 | 16 | 28 | 15 | 17 | 16 | 12 | 12 | 16 | 16 | 14 | 13 | 12 | 16 | 11 | 12 | 14 | 25 | 2 | 107 | 16 | 44 |
| DIXMAANG | 300 | 0 | 24 | 42 | 33 | 15 | 12 | 13 | 13 | 24 | 24 | 16 | 29 | 17 | 41 | 16 | 36 | 15 | 21 | 2 | 327 | 25 | 138 |
| DIXMAANG | 1500 | 0 | 21 | 110 | 35 | 24 | 15 | 15 | 15 | 21 | 21 | 40 | 32 | 32 | 42 | 26 | 28 | 21 | 31 | 2 | 444 | 24 | 528 |
| DIXMAANG | 3000 | 0 | 50 | 188 | 31 | 19 | 19 | 15 | 15 | 50 | 50 | 37 | 27 | 42 | 27 | 52 | 28 | 21 | 30 | 2 | —I— | 40 | 924 |
| DIXMAANH | 15 | 0 | 13 | 21 | 14 | 11 | 12 | 14 | 9 | 10 | 13 | 12 | 11 | 12 | 12 | 12 | 12 | 11 | 14 | 2 | 65 | 17 | 45 |
| DIXMAANH | 90 | 0 | 19 | 28 | 18 | 15 | 14 | 15 | 13 | 19 | 19 | 15 | 16 | 18 | 30 | 11 | 23 | 15 | 29 | 2 | 142 | 15 | 88 |
| DIXMAANH | 300 | 0 | 23 | 33 | 22 | 20 | 18 | 16 | 13 | 23 | 23 | 26 | 25 | 29 | 33 | 28 | 21 | 20 | 34 | 2 | —I— | 21 | 238 |
| DIXMAANH | 1500 | 0 | 38 | 99 | 33 | 22 | 17 | 18 | 16 | 38 | 38 | 38 | 29 | 24 | 31 | 28 | 25 | 21 | 33 | 2 | —I— | 29 | 872 |
| DIXMAANH | 3000 | 0 | 39 | 184 | 54 | —T— | 19 | 24 | 15 | 39 | 39 | 40 | 46 | 38 | 48 | 31 | 67 | 20 | 130 | 2 | —I— | 40 | —I— |
| DIXMAANI | 15 | 0 | 5 | 19 | 8 | 9 | 7 | 14 | 6 | 6 | 5 | 6 | 5 | 5 | 6 | 5 | 6 | 7 | 11 | 2 | 52 | 14 | 32 |
| DIXMAANI | 90 | 0 | 6 | 13 | 10 | 8 | 7 | 13 | 6 | 6 | 6 | 6 | 5 | 5 | 6 | 6 | 9 | 8 | 13 | 2 | 86 | 10 | —I— |
| DIXMAANI | 300 | 0 | 6 | 16 | 14 | 7 | 7 | 16 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 15 | 8 | 21 | 2 | 106 | 13 | —I— |
| DIXMAANI | 1500 | 0 | 7 | 17 | 16 | 7 | 7 | 18 | 6 | 7 | 7 | 6 | 5 | 7 | 6 | 7 | 19 | 7 | 38 | 2 | 161 | 13 | 3 |
| DIXMAANI | 3000 | 0 | 7 | 17 | 22 | 7 | 7 | 18 | 6 | 7 | 7 | 6 | 6 | 7 | 6 | 7 | 10 | 7 | 113 | 2 | 172 | 15 | 2 |
| DIXMAANJ | 15 | 0 | 12 | 0 | 10 | 14 | 12 | 11 | 8 | 13 | 12 | 14 | 15 | 13 | 6 | 12 | 12 | 14 | 17 | 2 | 333 | 14 | 39 |
| DIXMAANJ | 90 | 0 | 20 | 0 | 23 | 14 | 17 | 16 | 10 | 20 | 20 | 16 | 18 | 27 | 26 | 20 | 36 | 15 | 30 | 2 | 283 | 20 | 690 |
| DIXMAANJ | 300 | 0 | 21 | 0 | 32 | 14 | 21 | 25 | 14 | 21 | 21 | 38 | 34 | 27 | 38 | 29 | 20 | 16 | 32 | 2 | 121 | 42 | —I— |
| DIXMAANJ | 1500 | 0 | 34 | 0 | 341 | 20 | 28 | 30 | 25 | 31 | 34 | 63 | 38 | 49 | 28 | 31 | 27 | 20 | 25 | 2 | 124 | 43 | 2 |
| DIXMAANJ | 3000 | 0 | 40 | 0 | 794 | —T— | 43 | 27 | 14 | 38 | 39 | 79 | 49 | 50 | 27 | 30 | 49 | 21 | 27 | 2 | 50 | 40 | 2 |
| DIXMAANK | 15 | 0 | 16 | 22 | 16 | 12 | 12 | 13 | 9 | 9 | 16 | 18 | 12 | 16 | 10 | 16 | 17 | 15 | 44 | 2 | 139 | 13 | 59 |
| DIXMAANK | 90 | 0 | 18 | 177 | 58 | 13 | 17 | 25 | 15 | 18 | 18 | 23 | 17 | 19 | 23 | 25 | 22 | 20 | 36 | 2 | 196 | 25 | —I— |
| DIXMAANK | 300 | 0 | 24 | 107 | 44 | 22 | 23 | 26 | 12 | 24 | 24 | 39 | 41 | 32 | 33 | 34 | 29 | 19 | 29 | 2 | 191 | 30 | —I— |
| DIXMAANK | 1500 | 0 | 35 | 271 | 84 | 21 | 36 | 27 | 20 | 40 | 35 | 55 | 50 | 70 | 31 | 31 | 41 | 22 | 31 | 2 | 100 | 42 | 2 |
| DIXMAANK | 3000 | 0 | 32 | 241 | 184 | —T— | 39 | 29 | 20 | 32 | 32 | 59 | 28 | 61 | 24 | 39 | 86 | 21 | 28 | 2 | 81 | 43 | 2 |
| DIXMAANL | 15 | 0 | 15 | 23 | 16 | 15 | 12 | 15 | 10 | 10 | 15 | 14 | 15 | 15 | 15 | 16 | 12 | 14 | 21 | 2 | 126 | 19 | 65 |
| DIXMAANL | 90 | 0 | 42 | 65 | 41 | 18 | 20 | 20 | 11 | 42 | 42 | 32 | 33 | 29 | 18 | 18 | 39 | 17 | 83 | —I— | 349 | 20 | —I— |
| DIXMAANL | 300 | 0 | 25 | 107 | 82 | 19 | 30 | 35 | 15 | 25 | 25 | 44 | 47 | 51 | 29 | 43 | 43 | 18 | 33 | —E— | 607 | 35 | —I— |
| DIXMAANL | 1500 | 0 | 43 | 223 | 178 | 18 | 34 | 31 | 19 | 39 | 43 | 75 | 36 | 67 | 39 | 55 | 54 | 19 | 29 | —T— | 107 | 49 | 2 |
| DIXMAANL | 3000 | 0 | 47 | 160 | 254 | —T— | 36 | 28 | 17 | 52 | 47 | 74 | 79 | 74 | 26 | 57 | 43 | 35 | 36 | —T— | 83 | 48 | 2 |
| DIXON3DQ | 10 | 0 | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 50 | 0 | 2 | 2 | 2 | 2 | 4 | 9 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 100 | 0 | 2 | 2 | 2 | 2 | 4 | 9 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |

Number of minor iterations ( 5 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXON3DQ | 500 | 0 | 2 | 2 | 2 | 2 | 5 | 11 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 1000 | 0 | 2 | 2 | 2 | 2 | 5 | 12 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 5000 | 0 | 2 | 2 | 2 | 2 | 5 | 14 | 5 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 8 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 10 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 50 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 100 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 500 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 1000 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 5000 | 0 | 2 | 3 | 2 | 2 | 2 | 25 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 8 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQRTIC | 10 | 0 | 17 | 18 | 17 | 17 | 17 | 121 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| DQRTIC | 50 | 0 | 24 | 29 | 23 | 23 | 24 | —I— | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 25 | 24 | 24 | 24 | 24 | 24 | 24 |
| DQRTIC | 100 | 0 | 26 | 34 | 26 | 26 | 26 | —I— | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 28 | 26 | 26 | 26 | 26 | 26 | 26 |
| DQRTIC | 500 | 0 | 33 | 41 | 32 | 32 | 33 | —I— | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 36 | 33 | 33 | 33 | 33 | 33 | 33 |
| DQRTIC | 1000 | 0 | 35 | 45 | 35 | 35 | 35 | —I— | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 39 | 35 | 35 | 35 | 35 | 35 | 35 |
| DQRTIC | 5000 | 0 | 42 | 54 | 41 | 41 | 42 | —I— | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 47 | 42 | 42 | 42 | 42 | 42 | 42 |
| EDENSCH | 36 | 0 | 12 | 11 | 14 | 12 | 13 | 88 | 13 | 12 | 12 | 13 | 14 | 13 | 13 | 12 | 17 | 12 | 41 | —I— | 15 | 12 | 12 |
| EDENSCH | 2000 | 0 | 12 | 11 | 14 | 12 | 14 | 88 | 12 | 12 | 12 | 14 | 14 | 14 | 13 | 12 | 21 | 12 | 57 | —I— | 14 | 12 | 12 |
| ENGVAL1 | 2 | 0 | 7 | 7 | 7 | 7 | 7 | 12 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 21 | 7 | 7 | 7 |
| ENGVAL1 | 50 | 0 | 7 | 7 | 7 | 7 | 7 | 14 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 7 | 7 | 26 | 7 | 7 | 7 |
| ENGVAL1 | 100 | 0 | 7 | 7 | 7 | 7 | 7 | 14 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 10 | 7 | 7 | 26 | 7 | 7 | 7 |
| ENGVAL1 | 1000 | 0 | 7 | 12 | 7 | 7 | 7 | 14 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 11 | 7 | 7 | 27 | 7 | 7 | 7 |
| ENGVAL1 | 5000 | 0 | 7 | 12 | 7 | 7 | 7 | 14 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 12 | 7 | 7 | —S— | 7 | 7 | 7 |
| ENGVAL2 | 3 | 0 | 18 | 18 | 20 | 17 | 17 | 62 | 21 | 20 | 18 | 21 | 19 | 18 | 19 | 20 | 19 | 20 | 19 | 19 | 19 | 20 | 20 |
| ERRINBAR | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| ERRINROS | 10 | 0 | 53 | —S— | 47 | 44 | 75 | ( 62) | 77 | 53 | 53 | 47 | 49 | 47 | 50 | 53 | 53 | 70 | 111 | 111 | 42 | 42 | 49 |
| ERRINROS | 25 | 0 | 52 | 76 | 64 | 50 | 76 | ( 51) | 108 | 52 | 52 | 59 | 50 | 59 | 61 | 59 | 55 | 74 | 108 | 108 | 46 | 46 | 82 |
| ERRINROS | 50 | 0 | 74 | 67 | 68 | 46 | 78 | ( 103) | 93 | 74 | 74 | 62 | 65 | 62 | 47 | 71 | 73 | 72 | 103 | 103 | 47 | 47 | 141 |
| EXPFIT | 2 | 0 | 13 | 13 | —E— | —E— | 13 | —E— | 13 | 13 | 13 | 14 | 13 | 15 | 13 | 11 | 13 | 13 | 12 | —I— | 10 | 14 | 14 |
| EXPFITA | 5 | 22 | 17 | 30 | —I— | 14 | 32 | 439 | 22 | 28 | 20 | 18 | 14 | 16 | 16 | 17 | 21 | 17 | 44 | —I— | 74 | 80 | 70 |
| EXPFITB | 5 | 102 | 63 | 53 | —I— | 27 | 52 | 916 | 57 | 64 | 66 | 23 | 29 | 29 | 30 | 62 | 345 | 61 | 116 | —I— | 224 | 90 | 163 |
| EXPFITC | 5 | 502 | 88 | —S— | —T— | 44 | 87 | —I— | 89 | 89 | 83 | 54 | 43 | 45 | 55 | 88 | 599 | 81 | 149 | —I— | 280 | 115 | —I— |
| EXTROSNB | 5 | 0 | 63 | 64 | 68 | 62 | 75 | 198 | 95 | 63 | 63 | 63 | 63 | 63 | 63 | 63 | 70 | 62 | 70 | 70 | 63 | 63 | 63 |
| EXTROSNB | 10 | 0 | 521 | 471 | 532 | 474 | 387 | —I— | 650 | 521 | 521 | 492 | 492 | 492 | 492 | 521 | 502 | 462 | 617 | 617 | 499 | 499 | 499 |
| FREUROTH | 2 | 0 | 9 | 6 | 9 | 9 | 9 | 48 | 11 | 9 | 9 | 11 | 9 | 9 | 9 | 9 | 9 | 10 | 15 | 34 | 8 | 8 | 8 |
| FREUROTH | 10 | 0 | 11 | 6 | 11 | 11 | 10 | 49 | 14 | 11 | 11 | 11 | 8 | 11 | 11 | 13 | 11 | 12 | 21 | 40 | 14 | 14 | 14 |
| FREUROTH | 50 | 0 | 10 | 6 | 12 | 12 | 10 | 49 | 14 | 10 | 10 | 10 | 11 | 10 | 11 | 10 | 10 | 11 | 20 | 38 | 10 | 10 | —I— |
| FREUROTH | 100 | 0 | 10 | 6 | 12 | 12 | 10 | 49 | 14 | 10 | 10 | 10 | 11 | 10 | 11 | 10 | 9 | 11 | 20 | 45 | 10 | 10 | —I— |
| FREUROTH | 500 | 0 | 10 | 6 | 12 | 12 | 10 | 49 | —S— | 10 | 10 | 10 | 11 | 10 | 11 | 11 | 11 | 11 | —S— | —S— | 10 | 10 | 25 |
| FREUROTH | 1000 | 0 | 10 | 6 | 12 | 12 | —S— | 49 | —S— | 10 | 10 | 10 | 11 | 10 | 11 | 10 | 12 | 11 | 35 | —S— | 10 | 10 | —S— |
| FREUROTH | 5000 | 0 | 10 | 6 | 12 | 12 | 10 | 49 | —S— | 10 | 10 | 10 | 11 | 10 | 11 | 12 | —S— | 11 | —S— | —S— | 10 | 10 | —S— |
| GAUSSELM | 14 | 11 | 32 | —E— | 62 | ( 10) | ( 6) | ( 11) | ( 32) | ( 20) | ( 29) | 38 | 25 | ( 19) | 37 | 37 | 41 | 24 | 84 | —I— | 30 | 27 | 27 |
| GAUSSELM | 506 | 1135 | —T— | —E— | —I— | ( 656) | ( 9) | —I— | 262 | ( 388) | —T— | —I— | ( 455) | ( 371) | ( 295) | ( 405) | ( 322) | —T— | —I— | —I— | ( 312) | ( 217) | ( 858) |
| GAUSSELM | 650 | 1496 | —T— | —E— | —I— | ( 235) | ( 8) | —I— | —T— | 205 | ( 188) | —I— | ( 390) | ( 577) | ( 358) | ( 273) | —T— | —T— | —I— | —I— | —T— | —T— | ( 687) |
| GOTTFR | 2 | 0 | 30 | 30 | 15 | 19 | 16 | 367 | 15 | 30 | 30 | 29 | 16 | 16 | 15 | 30 | 27 | 18 | 11 | 10 | 16 | 14 | 14 |
| GRIDNETA | 60 | 36 | 23 | 26 | 9 | 8 | 16 | 53 | 23 | 24 | 8 | 8 | 8 | 8 | 18 | 22 | 24 | 21 | 23 | 443 | 22 | 23 | 23 |
| GRIDNETA | 180 | 100 | 25 | 37 | 13 | 13 | 19 | 84 | 25 | 25 | 26 | 13 | 13 | 13 | 27 | 25 | 27 | 25 | 25 | 286 | 25 | 25 | 25 |
| GRIDNETA | 612 | 324 | 28 | 40 | 12 | 13 | 20 | 96 | 29 | 28 | 28 | 12 | 12 | 12 | 26 | 26 | 31 | 28 | 28 | 385 | 28 | 28 | 28 |
| GRIDNETA | 924 | 484 | 36 | 50 | 22 | 22 | 27 | 179 | 36 | 37 | 36 | 22 | 22 | 22 | 36 | 37 | 41 | 37 | 37 | 316 | 37 | 37 | 37 |
| GRIDNETA | 3444 | 1764 | 35 | 51 | —I— | 17 | 28 | 148 | 38 | 38 | 35 | 18 | 18 | 18 | 33 | 33 | 40 | 31 | 35 | 433 | 35 | 35 | 36 |
| GRIDNETA | 7564 | 3844 | 56 | —T— | —I— | 30 | —T— | —T— | —T— | —T— | —T— | 30 | 30 | 30 | —T— | 56 | —T— | —T— | 58 | —T— | —T— | 58 | —T— |
| GRIDNETA | 13284 | 6724 | —T— | —T— | —I— | 61 | —T— | —T— | —T— | —T— | —T— | 62 | 62 | 62 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETB | 60 | 36 | 19 | 19 | 7 | 7 | 14 | 41 | 18 | 21 | 20 | 7 | 7 | 7 | 17 | 20 | 21 | 20 | 20 | —I— | 19 | 20 | 19 |
| GRIDNETB | 180 | 100 | 21 | 21 | 8 | 8 | 14 | 58 | 21 | 21 | 21 | 8 | 8 | 8 | 21 | 21 | 24 | 22 | 21 | —I— | 21 | 21 | 21 |
| GRIDNETB | 612 | 324 | 22 | 22 | 8 | 8 | 14 | 84 | 22 | 23 | 22 | 8 | 8 | 8 | 22 | 22 | 25 | 22 | 22 | —I— | 21 | 22 | 29 |
| GRIDNETB | 924 | 484 | 26 | 26 | 9 | 9 | 16 | 93 | 25 | 26 | 26 | 9 | 9 | 9 | 25 | 25 | 29 | 25 | 25 | —I— | 25 | 25 | 25 |
| GRIDNETB | 3444 | 1764 | 26 | 26 | 9 | 9 | 16 | 116 | 26 | 29 | 26 | 9 | 9 | 9 | 28 | 26 | 32 | 26 | 26 | —I— | 26 | 26 | 26 |
| GRIDNETB | 7564 | 3844 | 27 | 27 | 9 | 9 | 16 | 123 | 27 | 29 | 27 | 9 | 9 | 9 | 27 | 27 | 33 | 27 | 27 | —I— | 27 | 27 | 27 |
| GRIDNETB | 13284 | 6724 | 27 | 27 | 9 | 9 | 16 | 127 | 27 | 29 | —T— | 9 | 9 | 9 | 27 | 27 | 35 | 27 | 27 | —I— | 27 | 27 | 27 |
| GRIDNETC | 60 | 36 | 20 | 32 | 350 | 8 | 15 | 41 | 21 | 22 | 21 | 8 | 8 | 8 | 15 | 19 | 24 | 20 | 20 | —I— | 20 | 20 | 20 |

Number of minor iterations ( 6 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRIDNETC | 180 | 100 | 23 | 32 | 365 | 7 | 15 | 58 | 21 | 22 | 22 | 7 | 7 | 7 | 22 | 22 | 25 | 23 | 21 | —I— | 22 | 22 | 22 |
| GRIDNETC | 612 | 324 | 23 | 33 | —I— | 10 | 17 | 83 | 25 | 24 | 23 | 11 | 11 | 11 | 22 | 22 | 25 | 23 | 24 | —I— | 23 | 24 | 23 |
| GRIDNETC | 924 | 484 | 28 | 34 | —I— | 11 | 19 | 92 | 26 | 26 | 28 | 11 | 11 | 11 | 26 | 27 | 29 | 28 | 26 | —I— | 28 | 26 | 29 |
| GRIDNETC | 3444 | 1764 | 30 | 43 | —I— | 15 | 19 | 105 | 29 | 31 | 30 | 15 | 15 | 15 | 28 | 32 | 33 | 30 | 33 | —I— | 32 | 33 | 31 |
| GRIDNETC | 7564 | 3844 | —T— | —T— | —I— | 28 | —T— | —T— | —T— | —T— | —T— | 27 | 27 | 27 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETD | 60 | 36 | 22 | 30 | 9 | 8 | 16 | 54 | 23 | 23 | 8 | 9 | 8 | 8 | 19 | 23 | 24 | 23 | 23 | 364 | 22 | 24 | 72 |
| GRIDNETD | 180 | 100 | 24 | 31 | 11 | 11 | 17 | 84 | 22 | 23 | 23 | 13 | 11 | 11 | 24 | 24 | 26 | 22 | 25 | 210 | 25 | 25 | 77 |
| GRIDNETD | 612 | 324 | 27 | 32 | 12 | 12 | 20 | 97 | 28 | 27 | 27 | 13 | 12 | 12 | 28 | 27 | 31 | 29 | 27 | 267 | 27 | 49 | 95 |
| GRIDNETD | 924 | 484 | 35 | 45 | 36 | 20 | 25 | 178 | 35 | 33 | 35 | 21 | 20 | 20 | 35 | 35 | 39 | 34 | 34 | 236 | 34 | 51 | 118 |
| GRIDNETD | 3444 | 1764 | 41 | 55 | —I— | 16 | 29 | 145 | 42 | 39 | 41 | 19 | 17 | 17 | 35 | 38 | 43 | —S— | 40 | 329 | 38 | 68 | 119 |
| GRIDNETD | 7564 | 3844 | —T— | —T— | —T— | 33 | —T— | —T— | —T— | —T— | —T— | 35 | 33 | 33 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETE | 60 | 36 | 20 | 20 | 7 | 7 | 14 | 41 | 18 | 20 | 20 | 7 | 7 | 7 | 17 | 20 | 21 | 19 | 20 | —I— | 19 | 23 | 307 |
| GRIDNETE | 180 | 100 | 21 | 21 | 8 | 8 | 14 | 58 | 21 | 21 | 21 | 8 | 8 | 8 | 22 | 21 | 23 | 22 | 21 | —I— | 21 | 30 | —I— |
| GRIDNETE | 612 | 324 | 22 | 22 | 8 | 8 | 14 | 83 | 22 | 23 | 22 | 8 | 8 | 8 | 22 | 22 | 25 | 22 | 23 | —I— | 22 | 47 | —I— |
| GRIDNETE | 924 | 484 | 25 | 25 | 9 | 9 | 16 | 93 | 25 | 26 | 25 | 9 | 9 | 9 | 26 | 25 | 28 | 25 | 25 | —I— | 25 | 43 | —I— |
| GRIDNETE | 3444 | 1764 | 26 | 26 | 11 | 11 | 16 | 113 | 26 | 29 | 26 | 11 | 11 | 11 | 36 | 26 | 33 | 26 | 26 | —I— | 27 | 62 | —I— |
| GRIDNETE | 7564 | 3844 | 27 | 27 | 11 | 11 | 16 | 120 | 27 | 29 | 27 | 11 | 11 | 11 | 27 | 27 | 33 | 27 | 27 | —I— | 27 | 62 | —I— |
| GRIDNETF | 60 | 36 | 19 | 33 | 80 | 7 | 14 | 40 | 21 | 21 | 20 | 8 | 7 | 7 | 16 | 20 | 23 | 20 | 20 | —I— | 18 | 20 | 153 |
| GRIDNETF | 180 | 100 | 22 | 32 | 544 | 9 | 15 | 61 | 21 | 22 | 21 | 10 | 9 | 9 | 23 | 22 | 24 | 22 | 23 | —I— | 22 | 36 | 497 |
| GRIDNETF | 612 | 324 | 23 | 35 | —I— | 9 | 15 | 81 | 23 | 24 | 23 | 11 | 9 | 9 | 23 | 23 | 25 | 23 | 22 | —I— | 24 | 50 | 245 |
| GRIDNETF | 924 | 484 | 25 | 38 | —I— | 12 | 18 | 89 | 26 | 26 | 25 | 12 | 10 | 10 | 27 | 26 | 30 | 26 | 28 | —I— | 28 | 54 | —I— |
| GRIDNETF | 3444 | 1764 | 29 | 40 | —I— | 13 | 20 | 102 | 29 | 31 | 29 | 14 | 13 | 13 | 28 | 30 | 35 | 30 | 34 | —I— | 32 | 77 | —I— |
| GRIDNETF | 7564 | 3844 | —T— | —T— | —T— | 26 | —T— | —T— | —T— | —T— | —T— | 29 | 28 | 28 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETG | 60 | 36 | 22 | 23 | 8 | 7 | 16 | 58 | 23 | 23 | 8 | 8 | 7 | 7 | 17 | 21 | 23 | 22 | 21 | 331 | 23 | 21 | 21 |
| GRIDNETH | 60 | 36 | 20 | 20 | 7 | 7 | 14 | 41 | 18 | 21 | 22 | 8 | 7 | 7 | 12 | 20 | 22 | 21 | 19 | —I— | 18 | 18 | 18 |
| GRIDNETI | 60 | 36 | 19 | 19 | 76 | 7 | 14 | 41 | 18 | 21 | 20 | 8 | 7 | 7 | 11 | 20 | 23 | 20 | 19 | 758 | 18 | 19 | 19 |
| GULF | 3 | 0 | 35 | 39 | 42 | 37 | 40 | —E— | 44 | 55 | 35 | 45 | 46 | 40 | 41 | 36 | 42 | 35 | 157 | —I— | 41 | 39 | 42 |
| HAGER1 | 21 | 10 | 7 | 7 | 5 | 4 | 7 | 64 | 12 | 7 | 10 | 6 | 4 | 4 | 4 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | 7 |
| HAGER1 | 101 | 50 | 9 | 10 | 12 | 6 | 6 | 484 | 17 | 9 | 9 | 8 | 3 | 3 | 5 | 9 | 9 | 6 | 9 | 9 | 9 | 9 | 9 |
| HAGER1 | 201 | 100 | 10 | 8 | 23 | 11 | 6 | —I— | 20 | 10 | 10 | 10 | 3 | 3 | 16 | 10 | 9 | 6 | 10 | 10 | 10 | 10 | 10 |
| HAGER1 | 1001 | 500 | 12 | 7 | 106 | 49 | 8 | —I— | 26 | 12 | 12 | 11 | 3 | 3 | 18 | 12 | 11 | 6 | 12 | 12 | 12 | 12 | 12 |
| HAGER1 | 2001 | 1000 | 12 | 9 | 211 | 98 | 7 | —I— | 30 | 12 | 12 | 14 | 3 | 3 | 15 | 12 | 11 | 6 | 12 | 12 | 12 | 12 | 12 |
| HAGER1 | 10001 | 5000 | 11 | 8 | —M— | —T— | —T— | —T— | —T— | 11 | 11 | 13 | 22 | —M— | 23 | 11 | 22 | 7 | 11 | 11 | 11 | 11 | 11 |
| HAGER2 | 21 | 10 | 8 | 12 | 6 | 5 | 5 | 61 | 11 | 8 | 10 | 7 | 5 | 5 | 5 | 8 | 9 | 8 | 8 | 17 | 8 | 8 | 8 |
| HAGER2 | 101 | 50 | 9 | 12 | 12 | 6 | 6 | 463 | 16 | 9 | 9 | 9 | 3 | 3 | 5 | 9 | 11 | 8 | 9 | 18 | 9 | 9 | 9 |
| HAGER2 | 201 | 100 | 10 | 9 | 23 | 12 | 5 | —I— | 16 | 10 | 10 | 11 | 4 | 4 | 15 | 10 | 11 | 8 | 10 | 16 | 10 | 10 | 10 |
| HAGER2 | 1001 | 500 | 11 | 15 | 105 | 50 | 7 | —I— | 26 | 11 | 11 | 13 | 4 | 4 | 17 | 11 | 12 | 7 | 10 | 18 | 10 | 10 | 10 |
| HAGER2 | 2001 | 1000 | 11 | 10 | —T— | 99 | 6 | —I— | 24 | 11 | 11 | —T— | 4 | —T— | 14 | 11 | 12 | 6 | 11 | 13 | 11 | 11 | 11 |
| HAGER2 | 10001 | 5000 | 10 | —S— | —M— | —I— | —T— | —T— | —T— | 10 | 10 | —E— | 21 | —M— | 15 | 10 | 28 | 5 | 8 | ( 9) | 8 | 8 | 8 |
| HAGER3 | 21 | 10 | 7 | 12 | 3 | 3 | 6 | 70 | 12 | 7 | 9 | 6 | 3 | 3 | 3 | 7 | 9 | 7 | 10 | 12 | 9 | 8 | 8 |
| HAGER3 | 101 | 50 | 10 | 12 | 4 | 4 | 5 | 511 | 16 | 10 | 10 | 10 | 4 | 4 | 6 | 10 | 10 | 7 | 11 | 12 | 11 | 10 | 10 |
| HAGER3 | 201 | 100 | 11 | 10 | 5 | 5 | 5 | —I— | 17 | 11 | 11 | 11 | 4 | 4 | 16 | 11 | 11 | 6 | 12 | 14 | 12 | 11 | 12 |
| HAGER3 | 1001 | 500 | 12 | 12 | 17 | 17 | 7 | —I— | 24 | 12 | 12 | 13 | 4 | 4 | 17 | 12 | 12 | 6 | 12 | 13 | 11 | 12 | 12 |
| HAGER3 | 2001 | 1000 | 12 | 10 | —T— | 32 | 6 | —I— | 28 | 12 | 12 | —T— | 4 | —T— | 15 | 12 | 9 | 6 | 14 | 19 | 12 | 12 | 12 |
| HAGER3 | 10001 | 5000 | 8 | —S— | —M— | —I— | —T— | —T— | —T— | 8 | 8 | —M— | 20 | —M— | 14 | 8 | 21 | 6 | 9 | 14 | 8 | 8 | 8 |
| HAGER4 | 21 | 10 | 9 | 15 | 12 | 6 | 8 | 275 | 14 | 10 | 7 | 8 | 7 | 7 | 7 | 7 | 8 | 6 | 15 | 22 | 16 | 15 | 24 |
| HAGER4 | 101 | 50 | 12 | 15 | 52 | 9 | 10 | —I— | 27 | 12 | 12 | 8 | 6 | 6 | 8 | 10 | 12 | 10 | 14 | 32 | 15 | 15 | 32 |
| HAGER4 | 201 | 100 | 12 | 14 | 105 | 12 | 10 | —I— | 54 | 12 | 12 | 7 | 6 | 6 | 11 | 11 | 15 | 10 | 14 | 22 | 17 | 14 | 36 |
| HAGER4 | 1001 | 500 | 13 | 19 | —T— | 45 | 9 | —I— | —T— | 13 | 13 | 8 | 8 | 8 | 23 | 13 | 15 | 12 | 12 | 34 | 13 | 13 | 42 |
| HAGER4 | 2001 | 1000 | 9 | 28 | —T— | 83 | —T— | —I— | —T— | 9 | 9 | 9 | 8 | —T— | 20 | 12 | 16 | 11 | 13 | 41 | 13 | 12 | 45 |
| HAGER4 | 10001 | 5000 | —T— | —T— | —M— | —T— | —T— | —I— | —T— | 12 | —T— | —T— | 16 | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| HAIRY | 2 | 0 | 102 | 116 | 74 | 87 | 102 | 95 | 140 | 102 | 102 | 97 | 87 | 96 | 108 | 89 | 91 | 72 | 77 | —S— | 107 | 101 | 121 |
| HATFLDA | 4 | 0 | 23 | 23 | 32 | 24 | 29 | 28 | 30 | 23 | 23 | 30 | 23 | 32 | 24 | 24 | 24 | 24 | 38 | 38 | 36 | 35 | 35 |
| HATFLDB | 4 | 0 | 20 | 20 | 20 | 21 | 26 | 25 | 27 | 20 | 20 | 27 | 20 | 21 | 21 | 20 | 20 | 21 | 30 | 30 | 33 | 32 | 32 |
| HATFLDC | 25 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| HATFLDD | 3 | 0 | 19 | 19 | 15 | 16 | 14 | 26 | 21 | 14 | 19 | 19 | 10 | 13 | 28 | 20 | 33 | 21 | 30 | —I— | 19 | 22 | 19 |
| HATFLDE | 3 | 0 | 22 | 22 | 23 | 18 | 15 | 21 | 21 | 15 | 22 | 17 | 11 | 14 | 24 | 22 | 22 | 19 | 28 | —I— | 27 | 23 | 17 |
| HATFLDF | 3 | 0 | 27 | 86 | 44 | 41 | 61 | 18 | 13 | 28 | 27 | 38 | 40 | 43 | 32 | 30 | 24 | 42 | 29 | —I— | 27 | 16 | 16 |
| HATFLDG | 25 | 0 | 16 | 16 | 14 | 14 | 15 | 11 | 13 | 16 | 15 | 13 | 14 | 12 | 16 | 16 | 15 | 14 | 23 | —I— | 13 | 13 | 14 |

Number of minor iterations ( 7 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HATFLDH | 4 | 7 | 11 | 10 | 62 | 18 | 10 | 34 | 15 | 15 | 9 | 13 | 9 | 9 | 10 | 9 | 11 | 11 | 121 | —I— | 18 | 12 | 13 |
| HELIX | 3 | 0 | 12 | —S— | 13 | 13 | 14 | 67 | 13 | 12 | 12 | 13 | 11 | 14 | 11 | 14 | 14 | 11 | 20 | —I— | 19 | 19 | 19 |
| HILBERTA | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTA | 4 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTA | 5 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTA | 6 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTA | 10 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTB | 5 | 0 | 2 | 2 | 2 | 2 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTB | 10 | 0 | 2 | 2 | 2 | 2 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| HILBERTB | 50 | 0 | 2 | 6 | 2 | 2 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| HIMMELBA | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| HIMMELBB | 2 | 0 | 12 | 6 | 17 | 20 | 20 | 164 | 14 | 12 | 12 | 21 | 23 | 22 | 12 | 12 | 12 | 12 | 11 | 11 | 22 | 16 | 16 |
| HIMMELBC | 2 | 0 | 8 | 8 | 8 | 8 | 8 | 12 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 7 | 8 | 8 | 7 | 8 | 8 | 8 |
| HIMMELBD | 2 | 0 | 38 | 36 | 45 | 34 | 37 | —I— | 41 | 38 | 38 | 41 | 38 | 38 | 38 | —S— | 58 | 41 | 37 | —S— | 37 | 37 | 38 |
| HIMMELBE | 3 | 0 | 3 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 3 | 5 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| HIMMELBF | 4 | 0 | 217 | 367 | —I— | 321 | 341 | —I— | 440 | 214 | 217 | 351 | 283 | 181 | 125 | 487 | 187 | 151 | 308 | —S— | 94 | 44 | 61 |
| HIMMELBG | 2 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 11 | 31 | 10 | 10 | 11 |
| HIMMELBH | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 23 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 |
| HIMMELBI | 100 | 12 | 36 | 40 | —I— | 76 | 25 | —I— | 31 | 28 | 39 | 36 | 17 | —E— | 21 | 34 | 318 | 26 | 131 | —E— | 335 | 145 | 120 |
| HIMMELBJ | 45 | 14 | —I— | —I— | 795 | 919 | —I— | 557 | —I— | —I— | —I— | —I— | —S— | 139 | —I— | —I— | —I— | 276 | —I— | —I— | —I— | —I— | —I— |
| HIMMELBK | 24 | 14 | 130 | ( 11) | —I— | 220 | 126 | —I— | 140 | 137 | ( 16) | 136 | ( 16) | 112 | 112 | 141 | 150 | 105 | 270 | —I— | 195 | 160 | 160 |
| HONG | 4 | 1 | 16 | 16 | 15 | 15 | 17 | 27 | 22 | 20 | 16 | 20 | 16 | 16 | 16 | 16 | 17 | 17 | 26 | 112 | 26 | 26 | 26 |
| HS1 | 2 | 0 | 33 | 57 | 32 | 33 | 30 | 79 | 40 | 33 | 33 | 39 | 35 | 34 | 35 | 33 | 36 | 33 | 35 | 35 | 26 | 26 | 26 |
| HS10 | 2 | 1 | 17 | 17 | 20 | 20 | 18 | —I— | 21 | 17 | 17 | 20 | 17 | 17 | 17 | 17 | 19 | 20 | 43 | 44 | 33 | 27 | 37 |
| HS100 | 7 | 4 | 52 | 52 | 37 | 21 | 31 | 503 | 40 | 54 | 37 | 41 | 33 | 31 | 49 | 54 | 288 | 30 | 72 | —I— | 56 | 48 | —I— |
| HS100MOD | 7 | 4 | 143 | —S— | 49 | —I— | 106 | —I— | —S— | —S— | —S— | 109 | 88 | 47 | 115 | —S— | —I— | 54 | 156 | —I— | 156 | —S— | —I— |
| HS101 | 7 | 5 | —I— | 122 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS102 | 7 | 5 | —I— | 135 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS103 | 7 | 5 | —I— | —S— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS104 | 8 | 5 | 56 | 46 | 63 | 32 | 53 | 162 | 45 | 79 | 40 | 72 | 33 | 30 | 39 | 56 | 56 | 44 | 122 | —I— | 79 | 70 | 125 |
| HS105 | 8 | 1 | ( 12) | 26 | ( 12) | 19 | 25 | ( 23) | ( 11) | ( 12) | ( 17) | 19 | ( 11) | ( 11) | 16 | ( 12) | ( 10) | ( 17) | —I— | —I— | 921 | ( 119) | —E— |
| HS106 | 8 | 6 | —I— | 70 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS107 | 9 | 6 | 30 | 37 | 39 | 32 | —S— | 376 | 34 | 33 | 22 | 34 | 22 | 23 | 22 | 30 | 31 | 30 | —S— | —I— | 41 | 46 | 46 |
| HS108 | 9 | 13 | 24 | 24 | 62 | 20 | 19 | 36 | 24 | 23 | 41 | 21 | 16 | 29 | 20 | 24 | 23 | 19 | 50 | —I— | 31 | 32 | 32 |
| HS109 | 9 | 10 | —I— | 242 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS11 | 2 | 1 | 15 | 15 | 14 | 14 | 15 | 87 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 16 | 15 | 46 | 15 | 15 | 15 |
| HS110 | 10 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 6 | 21 | 21 | 8 | 8 | 8 |
| HS111 | 10 | 3 | 47 | 47 | 50 | 36 | 51 | 82 | 56 | 54 | 47 | 73 | 41 | 59 | 55 | 52 | 48 | 48 | —I— | —I— | —I— | 169 | —I— |
| HS112 | 10 | 3 | 42 | 42 | 38 | 37 | 44 | 52 | 56 | 43 | 38 | 47 | 38 | 38 | 38 | 42 | 43 | 41 | 57 | —I— | 56 | 58 | 75 |
| HS113 | 10 | 8 | 88 | 58 | 47 | 36 | 49 | 599 | 66 | 101 | 83 | 74 | 38 | 38 | 38 | 80 | 822 | 45 | 78 | —I— | 76 | 97 | —I— |
| HS114 | 10 | 11 | 805 | 131 | —I— | —I— | —I— | —I— | —S— | 735 | 784 | 577 | —S— | 329 | —I— | 847 | —S— | 405 | —I— | —I— | —I— | 900 | —I— |
| HS116 | 13 | 14 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS117 | 15 | 5 | 66 | 61 | —I— | —I— | 71 | 507 | 53 | 36 | 102 | 64 | 40 | 49 | 46 | 49 | 89 | 60 | 523 | —I— | 84 | 67 | —I— |
| HS118 | 15 | 17 | 16 | 16 | —I— | 8 | 17 | 256 | 17 | 15 | 16 | 15 | 8 | 8 | 14 | 16 | 18 | 13 | 16 | 16 | 16 | 16 | 15 |
| HS119 | 16 | 8 | 29 | 35 | 53 | 43 | 23 | 128 | 30 | 32 | 28 | 28 | 27 | 27 | 27 | 29 | 29 | 29 | 99 | —I— | 39 | 41 | 58 |
| HS12 | 2 | 1 | 23 | 23 | 22 | 21 | 21 | 533 | 22 | 26 | 23 | 23 | 23 | 23 | 23 | 23 | 101 | 21 | 41 | —I— | 32 | 28 | 40 |
| HS13 | 2 | 1 | 58 | 54 | 58 | 58 | 58 | 64 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 58 | 57 | 58 | 267 | 262 | 87 | 87 | 87 |
| HS14 | 2 | 2 | 12 | 12 | 12 | 12 | 12 | 23 | 14 | 12 | 12 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 14 | 13 | 13 | 13 |
| HS15 | 2 | 2 | 46 | 46 | 57 | 54 | 39 | 487 | 47 | 46 | 46 | 44 | 47 | 47 | 46 | 46 | 47 | 46 | 93 | 133 | 54 | 78 | 123 |
| HS16 | 2 | 2 | 16 | 16 | 13 | 14 | 18 | 24 | 20 | 17 | 16 | 18 | 17 | 17 | 18 | 16 | 19 | 14 | 29 | 58 | 30 | 29 | 31 |
| HS17 | 2 | 2 | 19 | 19 | 15 | 18 | 20 | 28 | 20 | 20 | 19 | 21 | 20 | 18 | 18 | 19 | 19 | 18 | 28 | —S— | 32 | 37 | 40 |
| HS18 | 2 | 2 | 91 | 113 | 76 | 69 | 148 | 819 | 154 | 147 | 91 | 172 | 78 | 78 | 78 | 91 | 97 | 92 | 128 | —I— | 111 | 97 | 112 |
| HS19 | 2 | 2 | 34 | —S— | 36 | 34 | 30 | —I— | 36 | 35 | 34 | 35 | 42 | 34 | 34 | 34 | 97 | 34 | 36 | 34 | 35 | 35 | 43 |
| HS2 | 2 | 0 | 6 | 12 | 6 | 6 | 6 | 39 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 4 | 4 | 4 |
| HS20 | 2 | 3 | 23 | 23 | 26 | 24 | 23 | 52 | 29 | 27 | 23 | 26 | 23 | 23 | 23 | 23 | 22 | 23 | 21 | 37 | 22 | 21 | 21 |
| HS21 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 17 | 19 | 17 | 17 | 17 |
| HS22 | 2 | 2 | 9 | 9 | 9 | 9 | 9 | 17 | 10 | 9 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 12 | 11 | 12 | 12 | 12 |
| HS23 | 2 | 5 | 43 | 22 | 55 | 57 | 68 | 266 | 59 | 73 | 43 | 73 | 56 | 50 | 48 | 43 | 82 | 60 | 41 | 42 | 41 | 41 | 41 |
| HS24 | 2 | 3 | 7 | 7 | 8 | 8 | 7 | 20 | 9 | 10 | 7 | 9 | 7 | 7 | 7 | 7 | 8 | 7 | 20 | 20 | 13 | 13 | 13 |

Number of minor iterations ( 8 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS25 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS26 | 3 | 1 | 39 | 42 | 41 | 40 | 30 | 83 | 25 | 33 | 39 | 31 | 33 | 32 | 36 | 39 | 31 | 28 | 32 | —I— | 31 | 26 | 26 |
| HS27 | 3 | 1 | 16 | 25 | 16 | 18 | 22 | 25 | 16 | 17 | 16 | 19 | 15 | 15 | 16 | 16 | 12 | 18 | 33 | 113 | 39 | 24 | 31 |
| HS28 | 3 | 1 | 3 | 3 | 3 | 3 | 3 | 22 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 30 | 3 | 3 | 3 |
| HS29 | 3 | 1 | 30 | 30 | 29 | 29 | 19 | 133 | 35 | 41 | 30 | 35 | 26 | 31 | 31 | 29 | 66 | 28 | 39 | 54 | 35 | 43 | 45 |
| HS3 | 2 | 0 | 4 | 4 | 4 | 4 | 4 | 1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| HS30 | 3 | 1 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 10 | 30 | 10 | 10 | 10 |
| HS31 | 3 | 1 | 13 | 13 | 12 | 12 | 12 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 45 | —I— | 27 | 21 | 28 |
| HS32 | 3 | 2 | 10 | 13 | 11 | 5 | 10 | 27 | 12 | 9 | 10 | 11 | 10 | 10 | 10 | 10 | 7 | 5 | 12 | 12 | 12 | 12 | 12 |
| HS33 | 3 | 2 | ( 12) | ( 14) | ( 13) | ( 12) | ( 13) | ( 27) | ( 13) | ( 15) | ( 12) | ( 15) | ( 12) | ( 12) | ( 12) | ( 12) | ( 12) | ( 14) | ( 12) | ( 12) | ( 12) | ( 12) | 30 |
| HS34 | 3 | 2 | 19 | 19 | 16 | 18 | 18 | 27 | 21 | 19 | 19 | 16 | 18 | 18 | 21 | 19 | 18 | 22 | 23 | 23 | 21 | 21 | 21 |
| HS35 | 3 | 1 | 6 | 6 | 5 | 4 | 6 | 7 | 5 | 7 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 44 | —I— | 17 | 9 | 50 |
| HS36 | 3 | 1 | 11 | 11 | 15 | 11 | 12 | 213 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 16 | 11 | 18 | 17 | 17 | 15 | 15 |
| HS37 | 3 | 2 | 16 | 16 | 20 | 17 | 19 | 478 | 22 | 20 | 16 | 22 | 16 | 17 | 17 | 17 | 49 | 17 | 67 | 364 | 53 | 44 | 86 |
| HS38 | 4 | 0 | 58 | 58 | 57 | 78 | 58 | 189 | 72 | 63 | 58 | 56 | 57 | 59 | 59 | 57 | 50 | 51 | —I— | —I— | 56 | 57 | 27 |
| HS39 | 4 | 2 | 20 | 18 | 20 | 19 | 19 | 39 | 23 | 19 | 20 | 22 | 20 | 20 | 20 | 20 | 20 | 22 | 513 | 513 | 34 | 34 | 34 |
| HS4 | 2 | 0 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| HS40 | 4 | 3 | 10 | 10 | 9 | 9 | 10 | 9 | 12 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 14 | 99 | 15 | 15 | 19 |
| HS41 | 4 | 1 | 6 | 6 | 6 | 5 | 6 | 8 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 6 | 5 | 6 | 11 | 15 | 13 | 11 | 11 |
| HS42 | 4 | 2 | 12 | 11 | 10 | 10 | 11 | 10 | 13 | 12 | 12 | 11 | 12 | 12 | 12 | 12 | 10 | 12 | 12 | 31 | 12 | 12 | 12 |
| HS43 | 4 | 3 | 22 | 22 | 28 | 20 | 23 | 43 | 26 | 27 | 21 | 30 | 22 | 22 | 23 | 25 | 157 | 20 | 490 | —I— | 33 | 33 | 33 |
| HS44 | 4 | 6 | 6 | 6 | ( 15) | ( 43) | 10 | ( 73) | ( 12) | ( 11) | 6 | ( 12) | ( 6) | ( 7) | ( 6) | 6 | 26 | 6 | 32 | —I— | 9 | 8 | 8 |
| HS45 | 5 | 0 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| HS46 | 5 | 2 | 26 | 26 | 34 | 21 | 18 | 22 | 22 | 31 | 26 | 24 | 17 | 22 | 28 | 27 | 26 | 21 | 27 | 48 | 17 | 24 | 23 |
| HS47 | 5 | 3 | ( 21) | 80 | 79 | 77 | ( 23) | ( 20) | ( 26) | ( 23) | ( 21) | ( 23) | ( 21) | ( 21) | ( 22) | ( 21) | ( 22) | ( 23) | ( 25) | ( 37) | ( 23) | ( 23) | ( 23) |
| HS48 | 5 | 2 | 3 | 3 | 3 | 3 | 6 | 22 | 8 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 33 | 3 | 3 | 3 |
| HS49 | 5 | 2 | 15 | 15 | 15 | 15 | 16 | 64 | 19 | 19 | 15 | 18 | 15 | 15 | 15 | 15 | 15 | 15 | 24 | 52 | 24 | 24 | 48 |
| HS5 | 2 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| HS50 | 5 | 3 | 12 | 13 | 12 | 10 | 14 | 240 | 13 | 14 | 12 | 14 | 12 | 12 | 12 | 11 | 10 | 10 | 18 | 42 | 18 | 18 | 18 |
| HS51 | 5 | 3 | 2 | 2 | 2 | 2 | 7 | 12 | 9 | 10 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 39 | 2 | 2 | 2 |
| HS52 | 5 | 3 | 6 | 6 | 6 | 6 | 10 | 34 | 13 | 12 | 6 | 10 | 6 | 6 | 6 | 6 | 7 | 6 | 10 | 43 | 10 | 10 | 10 |
| HS53 | 5 | 3 | 6 | 6 | 6 | 6 | 10 | 30 | 12 | 10 | 6 | 11 | 6 | 6 | 6 | 6 | 7 | 6 | 11 | 13 | 11 | 11 | 11 |
| HS54 | 6 | 1 | ( 2) | —S— | ( 2) | ( 2) | ( 2) | 34 | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 39) | ( 39) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) |
| HS55 | 6 | 6 | 6 | 6 | 5 | 5 | 8 | 7 | 8 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 |
| HS56 | 7 | 4 | 19 | 16 | 18 | 23 | 25 | 22 | 13 | 20 | 13 | 29 | 21 | 18 | 16 | 18 | 13 | 13 | —I— | —I— | 40 | 35 | 83 |
| HS57 | 2 | 1 | ( 1) | 13 | 13 | —I— | ( 3) | 9 | 16 | ( 4) | ( 1) | 12 | 16 | 12 | 12 | ( 1) | ( 1) | ( 1) | ( 13) | ( 45) | ( 10) | ( 10) | ( 10) |
| HS59 | 2 | 3 | 387 | 70 | ( 421) | ( 267) | 470 | —I— | 437 | 441 | 387 | 443 | 421 | 413 | 400 | 396 | —I— | ( 349) | 480 | —I— | 394 | 405 | 607 |
| HS6 | 2 | 1 | 56 | 56 | 45 | 54 | 53 | 85 | 59 | 56 | 56 | 59 | 57 | 49 | 49 | 53 | 53 | 62 | 57 | 57 | 46 | 46 | 46 |
| HS60 | 3 | 1 | 15 | 19 | 31 | 11 | 16 | 39 | 26 | 23 | 15 | 20 | 15 | 27 | 24 | 14 | 14 | 10 | 23 | 38 | 25 | 22 | 22 |
| HS61 | 3 | 2 | 19 | 19 | 19 | 17 | 16 | 92 | 22 | 20 | 19 | 21 | 18 | 19 | 19 | 20 | 18 | 17 | 17 | 47 | 17 | 17 | 17 |
| HS62 | 3 | 1 | 34 | 34 | 40 | 34 | 34 | 305 | 35 | 34 | 34 | 35 | 34 | 34 | 34 | 34 | 33 | 34 | —I— | —I— | 60 | 60 | 60 |
| HS63 | 3 | 2 | 14 | 14 | 25 | 13 | 13 | 113 | 15 | 17 | 14 | 15 | 18 | 16 | 21 | 14 | 17 | 12 | 65 | 54 | 21 | 22 | 22 |
| HS64 | 3 | 1 | 50 | 46 | 49 | 49 | 51 | 603 | 50 | 51 | 50 | 50 | 50 | 50 | 50 | 50 | 50 | —T— | 63 | 65 | 63 | 63 | 65 |
| HS65 | 3 | 1 | 28 | 28 | 36 | 33 | 37 | 103 | 45 | 61 | 28 | 42 | 29 | 29 | 30 | 28 | 46 | 42 | 37 | 28 | 37 | 37 | 37 |
| HS66 | 3 | 2 | 9 | 14 | 8 | 7 | 11 | 7 | 10 | 9 | 9 | 10 | 7 | 9 | 9 | 9 | 8 | 9 | 13 | 25 | 13 | 13 | 13 |
| HS67 | 3 | 14 | 56 | 39 | —I— | 72 | 105 | 36 | 41 | 43 | 40 | 41 | 50 | 30 | 45 | 56 | 55 | 60 | —I— | —I— | 193 | 62 | —S— |
| HS68 | 4 | 2 | 92 | —I— | 75 | 81 | 115 | 492 | 116 | 103 | 92 | 113 | 88 | 94 | 90 | 92 | 93 | 95 | —I— | —I— | 143 | 136 | —I— |
| HS69 | 4 | 2 | 35 | 97 | 34 | 34 | 35 | —S— | 52 | —S— | 35 | 43 | 35 | 42 | 35 | 35 | —S— | 35 | —I— | —I— | 104 | —S— | —I— |
| HS7 | 2 | 1 | 18 | 18 | 17 | 17 | 19 | 101 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 17 | 18 | 23 | 38 | 27 | 27 | 27 |
| HS70 | 4 | 1 | 30 | 27 | ( 25) | 22 | 28 | ( 322) | 21 | 25 | 30 | 16 | 21 | 39 | 27 | 27 | 23 | 26 | —I— | —I— | 46 | 45 | 41 |
| HS71 | 4 | 2 | 15 | 15 | 20 | 14 | 15 | 46 | 18 | 17 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 41 | —I— | 21 | 24 | 30 |
| HS72 | 4 | 2 | 89 | 89 | 89 | 88 | 236 | 96 | 89 | 91 | 89 | 90 | 89 | 89 | 88 | 89 | 97 | —T— | 111 | 112 | 111 | 111 | 111 |
| HS73 | 4 | 3 | 15 | 15 | —I— | 20 | 16 | 454 | 23 | 18 | 15 | 24 | 21 | 23 | 22 | 15 | 110 | 15 | 18 | 17 | 18 | 18 | 18 |
| HS74 | 4 | 5 | 27 | 25 | 19 | 19 | 22 | —I— | 21 | 30 | 27 | 24 | 19 | 19 | 23 | 27 | 27 | 24 | —S— | 52 | 27 | 27 | 55 |
| HS75 | 4 | 5 | —S— | 27 | —S— | —I— | —I— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS76 | 4 | 3 | 6 | 6 | 11 | 6 | 7 | 16 | 8 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 35 | —I— | 12 | 19 | 33 |
| HS77 | 5 | 2 | 24 | 15 | 29 | 17 | 20 | ( 120) | 24 | 18 | 24 | 37 | 19 | 22 | 26 | 24 | 23 | 26 | 34 | —I— | 23 | 24 | 24 |
| HS78 | 5 | 3 | 11 | 11 | 10 | 10 | 9 | 15 | 14 | 15 | 11 | 11 | 11 | 10 | 12 | 13 | 13 | 10 | 25 | 40 | 16 | 13 | 49 |
| HS79 | 5 | 3 | 13 | 12 | 16 | 12 | 10 | 22 | 11 | 13 | 13 | 12 | 8 | 10 | 10 | 13 | 14 | 10 | 12 | 34 | 12 | 16 | 16 |

Number of minor iterations ( 9 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS8 | 2 | 2 | 11 | 11 | 11 | 10 | 10 | 49 | 10 | 11 | 11 | 10 | 9 | 9 | 10 | 8 | 10 | 10 | 10 | 8 | 9 | 9 | 9 |
| HS80 | 5 | 3 | 15 | 15 | 19 | 11 | 12 | 20 | 15 | 17 | 15 | 20 | 12 | 11 | 21 | 15 | 17 | 13 | 17 | 26 | 10 | 16 | 35 |
| HS81 | 5 | 3 | 17 | ( 183) | 18 | 11 | 12 | 19 | 14 | 18 | 17 | 17 | 13 | 11 | 19 | 17 | 18 | 16 | 854 | 44 | 26 | 25 | 37 |
| HS83 | 5 | 3 | 23 | 19 | 49 | 23 | 22 | 224 | 23 | 24 | 23 | 24 | 23 | 28 | 23 | 22 | 22 | 25 | 31 | 32 | 24 | 24 | 34 |
| HS84 | 5 | 3 | —S— | —S— | —I— | —I— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS85 | 5 | 21 | —I— | 44 | —I— | —I— | —I— | —I— | —S— | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —S— | —S— | —I— |
| HS86 | 5 | 10 | —S— | 17 | —I— | 86 | 14 | 97 | 14 | 14 | 16 | 14 | 15 | 18 | 18 | —S— | 30 | 18 | 482 | —I— | 41 | 21 | 91 |
| HS87 | 6 | 4 | 109 | —S— | —I— | —S— | —S— | —I— | —S— | —S— | 126 | —S— | —S— | —S— | 31 | 138 | 33 | 37 | —I— | —I— | 47 | 153 | —S— |
| HS88 | 2 | 1 | 53 | 53 | 54 | 53 | 47 | 55 | 54 | 53 | 53 | 54 | 55 | 55 | 55 | 54 | 54 | 54 | 97 | 165 | 108 | 95 | 83 |
| HS89 | 3 | 1 | ( 64) | ( 64) | ( 58) | ( 62) | ( 59) | ( 55) | ( 57) | ( 64) | ( 64) | ( 63) | 63 | ( 62) | ( 61) | ( 62) | ( 108) | —T— | ( 166) | ( 199) | ( 111) | ( 101) | ( 110) |
| HS9 | 2 | 1 | 4 | 4 | 5 | 4 | 6 | 39 | 6 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 5 | 6 | 10 | 12 | 10 | 10 | 10 |
| HS90 | 4 | 1 | —E— | —E— | —E— | —E— | —E— | 58 | —E— | —E— | —E— | 57 | —E— | —E— | —E— | 57 | 58 | 57 | —E— | 161 | —E— | —E— | —E— |
| HS91 | 5 | 1 | —E— | —E— | 101 | —E— | 61 | —E— | —E— | ( 95) | —E— | —E— | —E— | —E— | —E— | ( 113) | ( 69) | 59 | —E— | —I— | —E— | —E— | —E— |
| HS92 | 6 | 1 | —E— | —E— | —E— | —E— | —E— | 957 | —E— | —E— | —E— | —E— | 56 | 61 | —E— | 59 | 55 | 58 | —E— | —I— | —E— | —E— | —E— |
| HS93 | 6 | 2 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HS95 | 6 | 4 | 7 | 26 | —I— | 18 | 6 | 112 | 10 | 15 | 7 | 5 | 14 | 6 | 10 | 7 | 9 | 27 | 14 | 11 | 5 | 16 | 11 |
| HS96 | 6 | 4 | 7 | 23 | —I— | 21 | 30 | 100 | 10 | 15 | 17 | 5 | 14 | 6 | 4 | 7 | 10 | 16 | 14 | 11 | 6 | 6 | 10 |
| HS97 | 6 | 4 | 20 | ( 25) | ( 481) | ( 7) | ( 6) | ( 159) | ( 6) | ( 20) | 22 | ( 14) | ( 5) | ( 15) | ( 34) | 20 | ( 48) | ( 5) | ( 51) | —I— | ( 25) | ( 22) | ( 56) |
| HS98 | 6 | 4 | 16 | 52 | —I— | ( 7) | ( 5) | ( 159) | ( 6) | ( 32) | 21 | ( 10) | ( 5) | ( 7) | ( 32) | 25 | ( 41) | ( 5) | ( 15) | ( 32) | ( 21) | ( 21) | ( 43) |
| HS99 | 7 | 2 | —I— | —S— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —I— | —I— | —E— | —F— | —I— |
| HS99EXP | 31 | 21 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —I— | —F— | —I— | —I— | —E— | —I— | —I— | —I— | —I— | —I— | —I— |
| HUBFIT | 2 | 0 | 1 | 1 | 2 | 2 | 2 | 3 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HYDCAR20 | 99 | 99 | —F— | —E— | —F— | 154 | 70 | —E— | —F— | —F— | —F— | 116 | 149 | 196 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDCAR6 | 29 | 29 | —F— | —E— | —F— | 62 | —F— | 100 | —F— | —F— | —F— | 42 | 79 | 83 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDROELL | 1009 | 1008 | 127 | 246 | —I— | —I— | 138 | —I— | 133 | 127 | 127 | 129 | 139 | 125 | 135 | 131 | —I— | 126 | —I— | —I— | 766 | 993 | —I— |
| HYDROELM | 505 | 504 | 78 | 193 | —I— | —I— | 82 | —I— | 75 | 78 | 78 | 71 | 67 | 66 | 74 | 77 | —I— | 72 | —I— | —I— | 511 | —I— | —I— |
| HYDROELS | 169 | 168 | 37 | 143 | —I— | —I— | 36 | —I— | 36 | 37 | 37 | 29 | 31 | 28 | 35 | 34 | —I— | 34 | —I— | —I— | 660 | —I— | —I— |
| HYPCIR | 2 | 0 | 8 | 14 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 5 | 8 | 6 | 6 | 6 | 8 | 6 |
| INTEGREQ | 12 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| INTEGREQ | 52 | 0 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| INTEGREQ | 102 | 0 | 3 | —S— | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| JENSMP | 2 | 0 | 9 | 9 | 9 | 9 | 9 | 93 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | —I— | 8 | 8 | 8 |
| JNLBRNG1 | 16 | 0 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 15 | 2 | 2 | 2 |
| JNLBRNG1 | 100 | 0 | 3 | 5 | 1 | 1 | 3 | 4 | 3 | 3 | 1 | 1 | 1 | 1 | 2 | 3 | 5 | 4 | 4 | 40 | 4 | 4 | 4 |
| JNLBRNG1 | 529 | 0 | 5 | —S— | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 7 | 6 | 6 | 309 | 6 | 6 | 6 |
| JNLBRNG1 | 1024 | 0 | 6 | 7 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 6 | 7 | 6 | 7 | 583 | 7 | 7 | 7 |
| JNLBRNG1 | 5625 | 0 | 14 | 17 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 15 | —I— | 15 | 15 | 15 |
| JNLBRNG1 | 10000 | 0 | 19 | 20 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | —T— | 20 | 20 | 20 |
| JNLBRNG1 | 15625 | 0 | 24 | —I— | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 25 | —T— | 25 | 25 | 25 |
| JNLBRNG2 | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 12 | 3 | 3 | 3 |
| JNLBRNG2 | 100 | 0 | 3 | 5 | 2 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 4 | 4 | 90 | 4 | 4 | 4 |
| JNLBRNG2 | 529 | 0 | 4 | —S— | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 2 | 2 | 2 | 4 | 4 | 5 | 5 | 4 | 791 | 4 | 4 | 4 |
| JNLBRNG2 | 1024 | 0 | 4 | 6 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 5 | 5 | 964 | 5 | 5 | 5 |
| JNLBRNG2 | 5625 | 0 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 9 | 10 | —I— | 10 | 10 | 10 |
| JNLBRNG2 | 10000 | 0 | 11 | 13 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 12 | —I— | 12 | 12 | 12 |
| JNLBRNG2 | 15625 | 0 | 14 | —I— | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 15 | —T— | 15 | 15 | 15 |
| KOWOSB | 4 | 0 | 10 | 15 | 15 | 11 | 15 | 13 | 9 | 11 | 10 | 13 | 12 | 8 | 11 | 10 | 9 | 13 | 16 | —S— | 11 | 26 | 26 |
| LCH | 30 | 1 | 28 | —F— | —I— | 19 | ( 22) | ( 36) | ( 20) | 28 | 25 | 29 | 28 | 26 | 33 | 28 | 31 | 32 | —I— | —I— | 57 | 86 | 83 |
| LCH | 150 | 1 | 28 | —F— | ( 21) | 545 | ( 23) | 194 | 34 | 31 | 29 | 28 | 28 | 27 | 28 | 29 | 35 | 30 | —I— | —I— | 53 | 80 | 76 |
| LCH | 300 | 1 | 33 | —F— | 33 | 564 | ( 24) | 417 | 38 | 34 | 32 | 28 | 30 | 27 | 28 | 32 | 31 | 33 | —I— | —I— | 54 | 123 | 128 |
| LCH | 600 | 1 | 35 | —F— | —T— | —T— | ( 26) | 917 | 39 | 37 | 36 | 32 | 38 | 33 | 40 | 34 | 35 | 39 | —I— | —I— | 62 | 92 | 90 |
| LEAKNET | 156 | 153 | —S— | —F— | —I— | —I— | —I— | —I— | —S— | —I— | —S— | 99 | 68 | 69 | —I— | —S— | ( 429) | —S— | —I— | —I— | —S— | —S— | —I— |
| LEWISPOL | 6 | 9 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| LIARWHD | 36 | 0 | 12 | 28 | 15 | 14 | 10 | 116 | 11 | 12 | 15 | 15 | 10 | 10 | 10 | 16 | 22 | 12 | 12 | 15 | 12 | 12 | 12 |
| LIARWHD | 100 | 0 | 19 | 32 | 18 | 18 | 14 | 156 | 17 | 16 | 18 | 18 | 15 | 15 | 15 | 19 | 22 | 17 | 19 | 14 | 19 | 19 | 19 |
| LIARWHD | 500 | 0 | 16 | 39 | 23 | 19 | 15 | 265 | 18 | 19 | 20 | 18 | 16 | 16 | 16 | 26 | 19 | 19 | 16 | 17 | 16 | 16 | 16 |
| LIARWHD | 1000 | 0 | 20 | 57 | 23 | 19 | 15 | 346 | 19 | 23 | 20 | 19 | 22 | 22 | 22 | 25 | 26 | 19 | 20 | 16 | 20 | 20 | 20 |
| LIARWHD | 5000 | 0 | 36 | 64 | 22 | 19 | 18 | 679 | 19 | ( 23) | 21 | 19 | 22 | 22 | 22 | 37 | 50 | 19 | 36 | ( 19) | 36 | 36 | 36 |
| LIARWHD | 10000 | 0 | ( 23) | 58 | 22 | 18 | 18 | 928 | 19 | ( 51) | 39 | 19 | 22 | 22 | 22 | 54 | 29 | 18 | ( 23) | ( 65) | ( 23) | ( 23) | ( 23) |

Number of minor iterations ( 10 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINVERSE | 19 | 0 | 16 | 55 | ( 325) | 18 | 14 | 17 | 15 | ( 10) | 16 | 15 | 22 | 20 | 20 | 15 | 15 | 27 | —I— | —I— | 33 | 13 | —I— |
| LINVERSE | 199 | 0 | 13 | 53 | —I— | 20 | 11 | 12 | 12 | 14 | 13 | 71 | 28 | 32 | 29 | 19 | 25 | 12 | —I— | —I— | 22 | 17 | —I— |
| LINVERSE | 999 | 0 | 27 | ( 99) | 129 | 45 | 18 | 33 | 24 | 21 | 27 | 64 | 42 | 31 | 30 | 26 | 44 | 16 | —I— | —S— | 51 | 29 | 853 |
| LINVERSE | 1999 | 0 | 32 | —S— | 831 | —T— | ( 13) | 25 | 14 | 28 | 32 | 97 | 130 | 47 | 45 | 29 | 52 | 22 | —I— | —S— | 57 | 26 | —I— |
| LMINSURF | 16 | 0 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 33 | 6 | 6 | 6 |
| LMINSURF | 49 | 0 | 22 | 17 | 12 | 9 | 17 | 13 | 9 | 9 | 12 | 12 | 12 | 12 | 14 | 18 | 30 | 9 | 18 | 128 | 18 | 17 | 18 |
| LMINSURF | 64 | 0 | 19 | 28 | 12 | 8 | 18 | 15 | 19 | 22 | 12 | 12 | 12 | 12 | 16 | 18 | 20 | 8 | 24 | 276 | 26 | 24 | —I— |
| LMINSURF | 121 | 0 | 48 | 56 | 11 | 10 | 49 | 36 | 39 | 51 | 11 | 11 | 11 | 11 | 23 | 43 | 45 | 11 | 49 | 596 | 49 | 49 | 48 |
| LMINSURF | 961 | 0 | 232 | 260 | 21 | 20 | 521 | 167 | 229 | 232 | 232 | 21 | 21 | 21 | 41 | 261 | 273 | 22 | 269 | —I— | 313 | 276 | 262 |
| LMINSURF | 1024 | 0 | 277 | 369 | 21 | 26 | 477 | 188 | 312 | 268 | 281 | 21 | 21 | 21 | 67 | 330 | 277 | 25 | 282 | —I— | 283 | 287 | —I— |
| LMINSURF | 5625 | 0 | —I— | —I— | 38 | —T— | —I— | 764 | —I— | —I— | —I— | 38 | 38 | 38 | 421 | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| LMINSURF | 10000 | 0 | —I— | —I— | 39 | —T— | —I— | —I— | —I— | —I— | —I— | 39 | 39 | 39 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —I— |
| LMINSURF | 15625 | 0 | —T— | —T— | 44 | —T— | —I— | —I— | —T— | —T— | —T— | 44 | 44 | 44 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| LSQFIT | 2 | 0 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| LUBRIF | 151 | 100 | —F— | —I— | —I— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —I— | —F— | —F— | —F— | —I— | —I— | —I— | —F— | —I— |
| LUBRIF | 751 | 500 | —T— | —T— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| MANCINO | 10 | 0 | 7 | —S— | 5 | 5 | 4 | 371 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| MANCINO | 20 | 0 | 9 | —S— | 7 | 7 | 7 | —I— | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 9 |
| MANCINO | 30 | 0 | 10 | —S— | 8 | 8 | 8 | —I— | 11 | 10 | 10 | 10 | 8 | 8 | 8 | 10 | 12 | 12 | 10 | 10 | 10 | 10 | 10 |
| MANCINO | 50 | 0 | 12 | —S— | 10 | 10 | 9 | —I— | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 12 | 14 | 13 | 12 | 12 | 11 | 11 | 11 |
| MANNE | 300 | 200 | 6 | 11 | —I— | 10 | 7 | 10 | 12 | 11 | 6 | 19 | 8 | 801 | 6 | 7 | 7 | 7 | 92 | 92 | 8 | 8 | 8 |
| MANNE | 1095 | 730 | —S— | 143 | —S— | 78 | 11 | 8 | —S— | 15 | —S— | —T— | 10 | —E— | 8 | 11 | 11 | 6 | 45 | 45 | 11 | 11 | —S— |
| MARATOS | 2 | 1 | 7 | 9 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 8 | 29 | 8 | 8 | 8 |
| MARATOSB | 2 | 0 | —I— | —I— | —I— | —I— | —I— | 305 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| MATRIX2 | 6 | 2 | 10 | 10 | 10 | 10 | 10 | 14 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 13 | 43 | 13 | 13 | 13 |
| MAXLIKA | 8 | 0 | ( 9) | 42 | 45 | 24 | 26 | 29 | ( 7) | 23 | 22 | 25 | 22 | ( 8) | 23 | ( 9) | ( 8) | ( 6) | —I— | —S— | 609 | 164 | 560 |
| MCCORMCK | 10 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 6 | 37 | 6 | 6 | 6 |
| MCCORMCK | 50 | 0 | 4 | 7 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 6 | 39 | 6 | 6 | 6 |
| MCCORMCK | 100 | 0 | 4 | 7 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 6 | 37 | 6 | 6 | 6 |
| MCCORMCK | 500 | 0 | 4 | 7 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 4 | 6 | 42 | 6 | 6 | 6 |
| MCCORMCK | 1000 | 0 | 4 | 7 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 4 | 6 | 39 | 6 | 6 | 6 |
| MCCORMCK | 5000 | 0 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 4 | 6 | 44 | 6 | 6 | 6 |
| MCCORMCK | 10000 | 0 | 4 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 4 | 6 | 39 | 6 | 6 | 6 |
| MDHOLE | 2 | 0 | 63 | 63 | 65 | 58 | 61 | 161 | 62 | 63 | 63 | 68 | 66 | 54 | 66 | 63 | 53 | 59 | 67 | 58 | 59 | 59 | 59 |
| METHANB8 | 31 | 31 | —I— | —E— | 8 | 8 | 8 | 29 | —F— | —F— | 54 | 12 | 8 | 8 | —F— | —I— | —I— | —S— | —S— | —F— | —I— | —S— | —S— |
| METHANL8 | 31 | 31 | —F— | —E— | 599 | 214 | 82 | —E— | —F— | —F— | —F— | 149 | 192 | 78 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| MEXHAT | 2 | 0 | 19 | 19 | 19 | 19 | 30 | —I— | 18 | 19 | 19 | 18 | 19 | 19 | 19 | 19 | 18 | 18 | 25 | 484 | 19 | 24 | 19 |
| MEYER3 | 3 | 0 | 467 | —S— | —I— | —I— | 453 | —I— | —S— | 469 | 467 | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | 585 | —S— | —I— |
| MINPERM | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 8 | 6 | 12 | 6 | 10 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| MINPERM | 13 | 10 | 13 | 13 | 35 | 13 | 7 | 7 | 9 | 14 | 13 | 11 | 17 | 16 | 19 | 13 | 13 | 11 | 24 | —I— | 23 | 14 | 14 |
| MINPERM | 27 | 19 | 16 | 16 | 38 | 24 | 9 | 9 | 10 | 14 | 15 | 13 | 36 | 42 | 65 | 16 | 15 | 16 | 28 | —I— | 17 | 15 | 15 |
| MINPERM | 51 | 36 | 18 | 18 | 88 | 24 | 10 | 9 | 11 | 17 | 20 | 38 | 29 | 83 | 48 | 18 | 18 | 18 | 37 | —I— | 21 | 17 | 17 |
| MINPERM | 93 | 69 | 17 | 17 | 294 | 23 | 9 | 10 | 14 | 22 | 26 | 157 | 49 | 126 | 64 | 17 | 17 | 19 | 85 | —I— | 16 | 22 | 22 |
| MINPERM | 169 | 134 | 103 | 103 | —I— | 80 | 15 | 14 | 16 | 29 | 34 | 318 | 297 | 450 | 147 | 98 | 30 | 91 | 541 | —T— | 25 | 30 | 29 |
| MINPERM | 311 | 263 | 57 | 57 | —I— | 59 | 14 | 13 | 17 | 23 | 36 | 405 | 157 | 588 | 340 | 63 | 54 | 50 | 128 | —T— | 49 | 56 | 56 |
| MINPERM | 583 | 520 | 356 | 356 | —T— | —T— | 16 | 16 | 20 | 20 | 29 | —T— | —T— | —I— | 406 | 318 | 39 | 49 | —I— | —T— | 39 | 41 | 45 |
| MINPERM | 1113 | 1033 | 49 | 49 | —T— | —T— | 18 | 16 | 21 | 25 | 25 | —T— | —T— | —T— | 43 | 76 | 87 | 50 | 93 | —I— | 92 | 61 | 74 |
| MINSURF | 64 | 0 | 10 | 11 | 8 | 1 | 8 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 12 | 10 | 3 | 11 | 57 | 11 | 11 | 10 |
| MISTAKE | 9 | 13 | 32 | 32 | 109 | 28 | 26 | 18 | 36 | 39 | 56 | 38 | 33 | 32 | 21 | 31 | 33 | 27 | 70 | —I— | 40 | 39 | 39 |
| MSQRTA | 4 | 0 | 15 | 15 | 13 | 13 | 15 | 19 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 17 | 18 | 15 | 15 | 14 |
| MSQRTA | 49 | 0 | 17 | —I— | 26 | 21 | 17 | 16 | 17 | 15 | 18 | 20 | 19 | 22 | 23 | 17 | 18 | 16 | 21 | —I— | 16 | 23 | 18 |
| MSQRTA | 100 | 0 | 17 | 22 | 69 | 23 | 21 | 20 | 19 | 19 | 18 | 23 | 39 | 32 | 47 | 23 | 18 | 19 | 41 | —I— | 15 | 14 | 16 |
| MSQRTA | 529 | 0 | 42 | 42 | —T— | —T— | 35 | 51 | 38 | 40 | 45 | —T— | —T— | —T— | —T— | 73 | 55 | 37 | 247 | —I— | 43 | 40 | 93 |
| MSQRTA | 1024 | 0 | 44 | 44 | —T— | —T— | —T— | 78 | 40 | 39 | 35 | —T— | —T— | —T— | —T— | —T— | 40 | —T— | —T— | —T— | 37 | 39 | —T— |
| MSQRTB | 9 | 0 | 14 | 15 | 12 | 13 | 12 | 12 | 14 | 12 | 13 | 14 | 12 | 13 | 13 | 15 | 11 | 13 | 20 | —I— | 9 | 9 | 12 |
| MSQRTB | 49 | 0 | 18 | 42 | 0 | 19 | 18 | 15 | 16 | 16 | 21 | 18 | 23 | 25 | 28 | ( 390) | 16 | 17 | 24 | —I— | 15 | 17 | 17 |
| MSQRTB | 100 | 0 | 22 | 32 | 0 | 25 | 20 | 22 | 22 | 22 | 21 | 22 | 51 | 34 | 62 | 26 | 19 | 25 | 35 | —I— | 19 | 19 | 24 |
| MSQRTB | 529 | 0 | 44 | 44 | —T— | —T— | 44 | 48 | 42 | 38 | 36 | 48 | —T— | —T— | —T— | 82 | 51 | 43 | 171 | —I— | 41 | 35 | 98 |
| MSQRTB | 1024 | 0 | 31 | 31 | —T— | —T— | 32 | 60 | 32 | 33 | 35 | —T— | —T— | —T— | —T— | 63 | 32 | 29 | —T— | —T— | 33 | 30 | —T— |

Number of minor iterations ( 11 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MWRIGHT | 5 | 3 | ( 19) | 24 | ( 20) | ( 18) | ( 20) | ( 37) | ( 23) | ( 20) | ( 19) | ( 22) | ( 19) | ( 19) | ( 20) | ( 19) | ( 18) | ( 18) | ( 550) | ( 645) | ( 28) | ( 28) | ( 31) |
| NGONE | 8 | 8 | 17 | 23 | 66 | 14 | 15 | 22 | 19 | 17 | 16 | 18 | 13 | 17 | 18 | 20 | 18 | 19 | 149 | —I— | 31 | 32 | 32 |
| NGONE | 12 | 19 | 39 | 57 | 212 | 33 | —E— | 39 | 34 | 42 | 36 | 32 | 37 | 36 | 39 | 38 | 40 | 40 | 98 | —I— | 45 | 37 | 34 |
| NGONE | 50 | 323 | —I— | —I— | —I— | —I— | ( 805) | —I— | —I— | ( 204) | —I— | —I— | ( 84) | 351 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | ( 964) | —I— |
| NGONE | 100 | 1273 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —T— | 983 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| NGONE | 500 | 31373 | —T— | —T— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —M— | —M— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NLMSURF | 16 | 0 | 10 | 10 | 10 | 11 | 10 | 9 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 10 | 11 | 10 | 68 | 10 | 10 | 9 |
| NLMSURF | 49 | 0 | 46 | 77 | 23 | 10 | 44 | 37 | 26 | 36 | 23 | 23 | 23 | 23 | 36 | 38 | 75 | 10 | 41 | 752 | 59 | 59 | 123 |
| NLMSURF | 64 | 0 | 48 | 76 | 13 | 11 | 64 | 56 | 49 | 46 | 13 | 13 | 13 | 13 | 47 | 48 | 72 | 11 | 52 | —I— | 52 | 52 | 138 |
| NLMSURF | 121 | 0 | 110 | 146 | 16 | 11 | 166 | 93 | 127 | 129 | 16 | 16 | 16 | 16 | 111 | 123 | 182 | 11 | 128 | —I— | 138 | 138 | 438 |
| NLMSURF | 961 | 0 | 678 | 845 | 18 | 16 | —I— | 596 | 764 | 688 | 693 | 18 | 18 | 18 | 153 | 820 | 697 | 18 | 731 | —I— | 817 | 740 | 924 |
| NLMSURF | 1024 | 0 | 837 | 806 | 19 | 18 | —I— | 653 | 784 | 774 | 833 | 19 | 19 | 19 | 201 | 830 | 772 | 18 | 690 | —I— | 784 | 722 | 827 |
| NLMSURF | 5625 | 0 | —I— | —I— | 23 | 25 | —I— | —I— | —I— | —I— | —I— | 23 | 23 | 23 | —I— | —I— | —I— | 24 | —I— | —I— | —I— | —I— | —I— |
| NLMSURF | 10000 | 0 | —I— | —I— | 22 | —T— | —I— | —I— | —I— | —I— | —I— | 22 | 22 | 22 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —E— |
| NLMSURF | 15625 | 0 | —T— | —T— | 27 | —T— | —I— | —I— | —T— | —T— | —T— | 27 | 27 | 27 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONDIA | 10 | 0 | 29 | 22 | 24 | 23 | 20 | 33 | 29 | 26 | 17 | 39 | 25 | 30 | 20 | 27 | 29 | 19 | 25 | 25 | 14 | 14 | 14 |
| NONDIA | 20 | 0 | 35 | 28 | 28 | 27 | 24 | 46 | 24 | 35 | 32 | 38 | 30 | 27 | 31 | 29 | 37 | 30 | 30 | 30 | 20 | 20 | 20 |
| NONDIA | 30 | 0 | 58 | 41 | 42 | 40 | 32 | 82 | 107 | 38 | 69 | 47 | 40 | 37 | 34 | 76 | 51 | 44 | 40 | 40 | 34 | 34 | 34 |
| NONDIA | 50 | 0 | 70 | 41 | 42 | 46 | 30 | 104 | 217 | 44 | 138 | 137 | 34 | 51 | 44 | 51 | 69 | 48 | 50 | 50 | 69 | 69 | 58 |
| NONDIA | 90 | 0 | 105 | 64 | 49 | 53 | 29 | 138 | 74 | 143 | 150 | 65 | 53 | 53 | 50 | 170 | 71 | 54 | 111 | 111 | 181 | 181 | 179 |
| NONDIA | 100 | 0 | 139 | 55 | 54 | 55 | 33 | 145 | 129 | 54 | 71 | 216 | 52 | 53 | 50 | 98 | 67 | 48 | 107 | 107 | 142 | 142 | 137 |
| NONDIA | 500 | 0 | 329 | 61 | 51 | 61 | 43 | 319 | 169 | 254 | 264 | 147 | 49 | 49 | 52 | 106 | 62 | 53 | 46 | 46 | 323 | 323 | 306 |
| NONDIA | 1000 | 0 | 265 | 47 | 49 | 60 | 44 | 450 | 245 | 236 | 300 | 282 | 45 | 45 | 51 | 79 | 64 | 57 | 78 | 78 | 77 | 77 | 73 |
| NONDIA | 5000 | 0 | 113 | ( 88) | 46 | —T— | 44 | —I— | 156 | 194 | 82 | 189 | 46 | 46 | 46 | 163 | 75 | —T— | 99 | 99 | 159 | 159 | 110 |
| NONDIA | 10000 | 0 | 144 | 119 | 51 | —T— | 44 | —I— | 304 | 81 | 69 | 272 | 49 | 49 | 47 | 137 | 62 | —T— | 99 | 99 | 97 | 97 | 92 |
| NONDQUAR | 100 | 0 | 15 | 15 | 15 | 15 | 66 | 23 | 105 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| NONDQUAR | 500 | 0 | 16 | 16 | 16 | 16 | 80 | 17 | 116 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 |
| NONDQUAR | 1000 | 0 | 17 | 17 | 17 | 17 | 91 | 19 | 174 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 |
| NONDQUAR | 5000 | 0 | 18 | 18 | 18 | 18 | 82 | 19 | 140 | 18 | 18 | 28 | 18 | 18 | 18 | 18 | 21 | 18 | 18 | 18 | 18 | 18 | 18 |
| NONMSQRT | 9 | 0 | 114 | 206 | —I— | —I— | ( 90) | —I— | ( 100) | ( 120) | 114 | ( 104) | ( 404) | 107 | 111 | 103 | ( 131) | ( 87) | —I— | —S— | 115 | 88 | —I— |
| NONMSQRT | 49 | 0 | —I— | —I— | —I— | —I— | ( 214) | —I— | ( 438) | —I— | ( 997) | 268 | —I— | 290 | ( 645) | —I— | —I— | —T— | —I— | —S— | —I— | —I— | —I— |
| NONMSQRT | 100 | 0 | —T— | —T— | —I— | —I— | 342 | —I— | ( 690) | —T— | —I— | —S— | —T— | —S— | —I— | —T— | —T— | —T— | —I— | —S— | —T— | —T— | —I— |
| NONMSQRT | 529 | 0 | —T— | —T— | —I— | —I— | —T— | —I— | —T— | —T— | —T— | —S— | —T— | —S— | —T— | —T— | —T— | —T— | —E— | —I— | —T— | —T— | —T— |
| NONMSQRT | 1024 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONSCOMP | 25 | 0 | 8 | 9 | 8 | 8 | 8 | 30 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 50 | 0 | 8 | 9 | 8 | 8 | 8 | 29 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 100 | 0 | 8 | 9 | 8 | 8 | 8 | 29 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 500 | 0 | 8 | 9 | 8 | 8 | 8 | 29 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 11 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 1000 | 0 | 8 | 9 | 8 | 8 | 8 | 30 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 5000 | 0 | 8 | 9 | 8 | 8 | 8 | 31 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 13 | 8 | 5 | 5 | 8 | 8 | 8 |
| NONSCOMP | 10000 | 0 | 8 | 9 | 8 | 8 | 8 | 31 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 13 | 8 | 5 | 5 | 8 | 8 | 8 |
| NYSTROM5 | 18 | 20 | —F— | —F— | —F— | 38 | 17 | 76 | 19 | 28 | —F— | 40 | 46 | —F— | 60 | —F— | —F— | 20 | 92 | —F— | 47 | —F— | —F— |
| OBSTCLAE | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OBSTCLAE | 100 | 0 | 3 | 4 | 12 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 5 | 4 | 5 | 41 | 5 | 5 | 5 |
| OBSTCLAE | 529 | 0 | 3 | 7 | 84 | 2 | 3 | 5 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 7 | 4 | 4 | 146 | 4 | 4 | 4 |
| OBSTCLAE | 1024 | 0 | 3 | 6 | 163 | 3 | 3 | 6 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 7 | 4 | 4 | 257 | 4 | 4 | 4 |
| OBSTCLAE | 5625 | 0 | 5 | 8 | 833 | —T— | 5 | 5 | 4 | 5 | 5 | 2 | 2 | 2 | 2 | 5 | 9 | 5 | 6 | —I— | 6 | 6 | 6 |
| OBSTCLAE | 10000 | 0 | 5 | 5 | —T— | —T— | 5 | 6 | 5 | 5 | —T— | —T— | —T— | —T— | —T— | 5 | 10 | 4 | 7 | —T— | 7 | 7 | 7 |
| OBSTCLAE | 15625 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| OBSTCLAL | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLAL | 100 | 0 | 4 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 7 | 44 | 7 | 7 | 7 |
| OBSTCLAL | 529 | 0 | 7 | 9 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 10 | 125 | 10 | 10 | 36 |
| OBSTCLAL | 1024 | 0 | 8 | 10 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 10 | 214 | 10 | 10 | 11 |
| OBSTCLAL | 5625 | 0 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | —I— | 18 | 18 | 18 |
| OBSTCLAL | 10000 | 0 | 19 | 21 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 22 | —I— | 22 | 22 | 48 |
| OBSTCLAL | 15625 | 0 | 24 | 26 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 27 | —T— | 27 | 27 | 34 |
| OBSTCLBL | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OBSTCLBL | 100 | 0 | 2 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 38 | 4 | 4 | 4 |
| OBSTCLBL | 529 | 0 | 5 | 6 | 18 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 6 | 6 | 210 | 6 | 6 | 6 |

Number of minor iterations ( 12 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBSTCLBL | 1024 | 0 | 7 | 8 | 43 | 5 | 6 | 7 | 7 | 7 | 7 | 5 | 5 | 5 | 6 | 6 | 8 | 7 | 7 | 452 | 7 | 7 | 7 |
| OBSTCLBL | 5625 | 0 | 12 | —S— | 168 | 12 | 12 | 13 | 12 | 12 | 12 | 11 | 11 | 11 | 12 | 13 | 13 | 13 | 13 | —I— | 13 | 13 | 85 |
| OBSTCLBL | 10000 | 0 | 16 | —S— | 349 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 29 | 15 | 16 | 15 | 15 | —T— | 15 | 22 | 52 |
| OBSTCLBL | 15625 | 0 | 18 | —S— | —T— | 17 | 18 | 18 | 18 | 18 | 18 | 17 | 17 | 17 | —T— | 18 | 19 | 18 | 19 | —T— | 19 | 27 | 95 |
| OBSTCLBM | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OBSTCLBM | 100 | 0 | 1 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 32 | 2 | 2 | 2 |
| OBSTCLBM | 529 | 0 | 3 | 5 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 4 | 3 | 4 | 4 | 108 | 4 | 4 | 4 |
| OBSTCLBM | 1024 | 0 | 4 | 5 | 7 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 352 | 4 | 4 | 4 |
| OBSTCLBM | 5625 | 0 | 5 | 6 | 27 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 6 | 5 | 5 | 5 | —I— | 5 | 5 | 5 |
| OBSTCLBM | 10000 | 0 | 4 | 6 | 49 | 4 | 4 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | —T— | 6 | 6 | 5 | 6 | —T— | 6 | 6 | 7 |
| OBSTCLBM | 15625 | 0 | 5 | —T— | 91 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | —T— | 6 | 5 | 5 | 6 | —T— | 6 | 6 | 6 |
| OBSTCLBU | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBU | 100 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 4 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 3 | 39 | 3 | 3 | 3 |
| OBSTCLBU | 529 | 0 | 6 | 8 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 250 | 6 | 6 | 6 |
| OBSTCLBU | 1024 | 0 | 7 | 8 | 9 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 7 | 8 | 7 | 8 | 390 | 8 | 8 | 12 |
| OBSTCLBU | 5625 | 0 | 13 | 15 | 23 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 13 | 13 | —I— | 13 | 13 | 15 |
| OBSTCLBU | 10000 | 0 | 16 | 18 | 31 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | —T— | 16 | 16 | 47 |
| OBSTCLBU | 15625 | 0 | 19 | 21 | 24 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 20 | 19 | 20 | 19 | 21 | —T— | 21 | 21 | 57 |
| OPTCNTRL | 32 | 20 | 23 | 18 | 43 | 25 | 25 | 400 | 33 | 33 | 24 | 23 | 25 | 25 | 25 | 23 | 28 | 23 | 23 | 28 | 23 | 23 | 23 |
| OPTMASS | 70 | 55 | —I— | 378 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| OPTMASS | 610 | 505 | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— |
| OPTMASS | 1210 | 1005 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— |
| OPTMASS | 3010 | 2505 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —E— | —I— | —I— | —I— | —I— |
| ORTHREGA | 133 | 64 | 124 | —S— | 145 | —I— | —S— | —I— | 99 | 113 | 152 | 131 | 72 | 113 | 158 | 127 | 128 | 103 | —I— | —I— | 247 | 164 | —I— |
| ORTHREGA | 517 | 256 | 160 | 269 | —T— | —I— | 149 | —I— | 123 | 170 | 170 | 163 | 92 | —T— | 322 | 160 | 148 | 122 | —I— | —I— | 268 | 215 | —I— |
| ORTHREGA | 2053 | 1024 | 185 | —S— | —M— | —I— | 247 | —I— | 154 | 182 | —S— | —T— | 138 | —E— | —T— | 197 | 189 | 132 | —I— | —I— | 283 | 249 | —I— |
| ORTHREGA | 8197 | 4096 | —S— | —S— | —M— | —T— | 189 | —I— | 186 | —S— | 242 | —E— | —T— | —E— | —T— | 222 | 239 | —T— | —I— | —I— | —S— | —S— | —T— |
| ORTHREGB | 27 | 6 | 95 | 312 | —I— | 70 | 10 | —I— | 399 | 83 | 70 | 265 | 106 | 170 | 135 | 104 | 175 | 138 | 167 | —I— | 119 | 86 | 201 |
| ORTHREGC | 25 | 10 | 42 | 77 | ( 81) | 31 | 26 | ( 241) | 57 | 44 | 39 | 39 | 27 | —I— | 43 | 39 | 44 | ( 39) | —I— | —I— | ( 53) | ( 89) | ( 75) |
| ORTHREGC | 105 | 50 | ( 88) | 149 | 77 | ( 330) | 34 | —I— | 50 | ( 58) | ( 79) | 62 | 38 | 48 | ( 109) | ( 71) | 36 | ( 49) | —I— | —I— | 84 | 91 | 225 |
| ORTHREGC | 505 | 250 | ( 57) | 127 | 281 | ( 164) | 32 | —I— | 42 | ( 66) | ( 60) | 50 | 32 | 61 | 43 | 46 | 42 | ( 50) | —I— | —I— | 67 | 104 | 356 |
| ORTHREGC | 1005 | 500 | 45 | —S— | 348 | ( 90) | 30 | —I— | 49 | 55 | 48 | 71 | 40 | 94 | 41 | 45 | 50 | ( 65) | —I— | —I— | ( 63) | ( 88) | ( 458) |
| ORTHREGC | 5005 | 2500 | 55 | —T— | —T— | —T— | 51 | —I— | 59 | 48 | 53 | 95 | 64 | —M— | 51 | 55 | 56 | —T— | —I— | —I— | 76 | 117 | —I— |
| ORTHREGC | 10005 | 5000 | 51 | —T— | —M— | —T— | 54 | —I— | 61 | 46 | —S— | —T— | 49 | —M— | —T— | 52 | 50 | —T— | —T— | —T— | 82 | 115 | —T— |
| ORTHREGD | 23 | 10 | 415 | —F— | 160 | 115 | 31 | —I— | 471 | 403 | 317 | 170 | 63 | 87 | 136 | 499 | 292 | 77 | 336 | 500 | 327 | 298 | 274 |
| ORTHREGD | 103 | 50 | 538 | —F— | 694 | 442 | 44 | —I— | 901 | 591 | 542 | 262 | 92 | —S— | 106 | —S— | —S— | 115 | 302 | —I— | 285 | 304 | 314 |
| ORTHREGD | 503 | 250 | 362 | —F— | —I— | —I— | 41 | —I— | —I— | 280 | 325 | 222 | 71 | 302 | 84 | —S— | —S— | 90 | 187 | —S— | 165 | —S— | —I— |
| ORTHREGD | 1003 | 500 | 260 | —F— | —I— | —I— | 50 | —I— | —I— | 297 | 264 | 310 | 99 | —S— | 65 | —S— | —S— | 88 | 137 | —S— | 148 | 160 | —I— |
| ORTHREGD | 5003 | 2500 | 163 | —F— | —T— | —T— | 53 | —I— | 423 | 147 | —S— | 654 | 126 | —T— | 43 | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —I— |
| ORTHREGD | 10003 | 5000 | 105 | —F— | —M— | —T— | 58 | —T— | —S— | 75 | 109 | —T— | —T— | —E— | —T— | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —T— |
| ORTHREGE | 36 | 20 | —S— | ( 176) | ( 181) | —I— | 49 | —I— | —S— | —S— | ( 234) | ( 102) | —I— | —I— | —I— | —S— | ( 126) | —S— | —I— | —I— | —I— | —S— | —I— |
| ORTHREGF | 80 | 25 | 61 | 277 | 111 | 36 | 29 | 98 | 71 | 64 | 57 | 32 | 41 | 39 | 50 | 56 | 60 | 42 | 94 | —I— | 51 | 77 | 74 |
| ORTHREGF | 152 | 49 | 62 | —I— | 68 | 33 | 21 | 65 | 84 | 97 | 66 | 33 | 44 | 50 | 43 | 63 | 68 | 38 | 291 | —I— | 94 | 142 | 99 |
| ORTHREGF | 305 | 100 | ( 72) | —I— | ( 127) | 41 | 29 | ( 205) | ( 96) | ( 85) | ( 87) | ( 75) | 35 | 64 | ( 60) | ( 105) | ( 77) | ( 45) | —I— | —I— | ( 54) | ( 80) | ( 72) |
| ORTHREGF | 680 | 225 | ( 150) | ( 279) | 139 | ( 44) | 35 | ( 263) | ( 133) | ( 130) | ( 94) | ( 91) | 41 | 74 | ( 54) | ( 126) | ( 187) | 44 | —I— | —I— | ( 100) | ( 96) | ( 363) |
| ORTHREGF | 1205 | 400 | —S— | —S— | ( 334) | ( 50) | 44 | ( 485) | ( 198) | ( 155) | ( 460) | ( 102) | 45 | 84 | 43 | ( 214) | ( 187) | ( 50) | —I— | —I— | ( 108) | ( 140) | ( 137) |
| OSBORNEA | 5 | 0 | 37 | —E— | 44 | 13 | 59 | —I— | 66 | 70 | 37 | 58 | 31 | 43 | 35 | 37 | 52 | 49 | 119 | —S— | 76 | 60 | 60 |
| OSBORNEB | 11 | 0 | 19 | 23 | 16 | 22 | 29 | —E— | 17 | 13 | 30 | 23 | 20 | 19 | 11 | 25 | ( 52) | 20 | 83 | —I— | 21 | 45 | 36 |
| PALMER1 | 4 | 0 | 29 | —S— | 307 | 29 | 29 | 209 | 32 | 28 | 29 | 37 | 29 | 29 | 39 | 30 | 39 | 28 | 36 | —S— | 48 | 31 | —S— |
| PALMER1A | 6 | 0 | 67 | 71 | 126 | —S— | 150 | —I— | —S— | 101 | 67 | 92 | 65 | 94 | 67 | 71 | 71 | 64 | 176 | —I— | 75 | 111 | 124 |
| PALMER1B | 4 | 0 | 38 | 43 | 195 | 38 | 37 | —I— | 38 | 43 | 38 | 35 | 36 | 36 | 34 | 39 | 36 | 36 | 76 | —S— | 44 | 60 | 60 |
| PALMER1C | 8 | 0 | 16 | 13 | 12 | 9 | 66 | —I— | 26 | —S— | 31 | 17 | 10 | 10 | 17 | 18 | 22 | 12 | 16 | 16 | 16 | 16 | 16 |
| PALMER1D | 7 | 0 | 14 | 8 | 12 | 9 | 47 | —I— | 13 | 14 | 13 | 17 | 8 | 8 | 16 | 15 | 16 | 10 | 14 | 14 | 14 | 14 | 14 |
| PALMER1E | 8 | 0 | 242 | 226 | —I— | 64 | 234 | —I— | 225 | 146 | 274 | 127 | 693 | 724 | 235 | 199 | 193 | 118 | —I— | —I— | 223 | 186 | 192 |
| PALMER2 | 4 | 0 | 20 | 49 | 102 | 54 | 26 | 126 | 31 | 22 | 20 | 46 | 20 | 20 | 20 | 20 | 25 | 29 | 127 | —S— | 37 | 26 | 35 |
| PALMER2A | 6 | 0 | 156 | 161 | 117 | 74 | 95 | 381 | 110 | 189 | 156 | 153 | 120 | 99 | 112 | 155 | 178 | 144 | 471 | —I— | 156 | 179 | 215 |
| PALMER2B | 4 | 0 | 100 | 100 | 143 | 30 | 35 | —I— | 81 | 105 | 100 | 70 | 100 | 100 | 100 | 19 | 19 | 29 | 95 | —S— | 94 | 110 | —S— |
| PALMER2C | 8 | 0 | 12 | —S— | 7 | 7 | 35 | —I— | 27 | 17 | 11 | 14 | 7 | 7 | 14 | 34 | 18 | 9 | 12 | 12 | 12 | 12 | 12 |
| PALMER2E | 8 | 0 | 107 | 118 | 298 | 70 | 145 | —I— | 249 | 281 | 322 | 179 | 335 | 283 | 302 | 157 | 134 | 143 | —I— | —I— | 175 | 244 | 181 |

Number of minor iterations ( 13 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PALMER3 | 4 | 0 | 37 | 52 | 53 | 43 | ( 30) | 107 | ( 39) | 41 | 37 | ( 31) | 35 | 44 | 56 | 58 | 16 | 43 | ( 69) | —I— | ( 47) | ( 62) | 136 |
| PALMER3A | 6 | 0 | 146 | 156 | 146 | 102 | 143 | —I— | 120 | 169 | 146 | 174 | 128 | 98 | 103 | 158 | 176 | 137 | —I— | —S— | 180 | 175 | 185 |
| PALMER3B | 4 | 0 | 65 | 65 | 105 | 28 | 25 | 86 | 38 | 94 | 65 | 33 | 49 | 68 | 28 | 19 | 40 | 24 | 45 | —S— | 28 | 21 | 21 |
| PALMER3C | 8 | 0 | 12 | 17 | 8 | 8 | 13 | —I— | 19 | 18 | 11 | 10 | 7 | 7 | 12 | 14 | 12 | 9 | 12 | 12 | 12 | 12 | 12 |
| PALMER3E | 8 | 0 | 74 | ( 103) | 35 | 40 | 114 | —I— | 186 | 158 | 239 | 87 | 45 | 39 | 206 | 84 | 64 | 110 | —I— | —I— | 131 | 145 | 160 |
| PALMER4 | 4 | 0 | 40 | 45 | ( 40) | 49 | ( 30) | 86 | ( 35) | 44 | 40 | ( 31) | 44 | 61 | 44 | 39 | 23 | 49 | —I— | —S— | ( 64) | 43 | —S— |
| PALMER4A | 6 | 0 | 47 | 73 | 143 | 74 | 71 | —I— | 60 | 77 | 47 | 99 | 92 | 56 | 78 | 69 | 66 | 69 | 110 | —I— | 77 | 113 | 105 |
| PALMER4B | 4 | 0 | 34 | 34 | 51 | 28 | 34 | 88 | 34 | 86 | 34 | 32 | 64 | 39 | 39 | —S— | 35 | 25 | 25 | —I— | 33 | 26 | 26 |
| PALMER4C | 8 | 0 | 39 | 32 | 8 | 8 | 42 | —I— | 20 | 16 | 27 | 15 | 7 | 7 | 16 | 21 | 30 | 10 | 39 | 39 | 39 | 39 | 39 |
| PALMER4E | 8 | 0 | 53 | 65 | 28 | 32 | 77 | —I— | 92 | 71 | 104 | 70 | 60 | 21 | 147 | 56 | 109 | 59 | —I— | —I— | 62 | 178 | 229 |
| PENALTY1 | 4 | 0 | 36 | 48 | 36 | 36 | 28 | 69 | 33 | 39 | 36 | 36 | 36 | 36 | 36 | 27 | 31 | 40 | 35 | 47 | 35 | 35 | 35 |
| PENALTY1 | 10 | 0 | 40 | 66 | 39 | 43 | 38 | 265 | 48 | 49 | 39 | 39 | 39 | 39 | 39 | 38 | 45 | 43 | 49 | 32 | 49 | 49 | 49 |
| PENALTY1 | 50 | 0 | 66 | 188 | 48 | 47 | 50 | —I— | 53 | 59 | 62 | 48 | 49 | 48 | 48 | 48 | 53 | 50 | 60 | 89 | 60 | 60 | 98 |
| PENALTY1 | 100 | 0 | 52 | 127 | 47 | 50 | 49 | —I— | 50 | 60 | 46 | 47 | 47 | 47 | 47 | 56 | 58 | 45 | 48 | 100 | 48 | 48 | 53 |
| PENALTY1 | 500 | 0 | 55 | 116 | 54 | 53 | 56 | —I— | 55 | 83 | 57 | 54 | 54 | 54 | 54 | 64 | 59 | 52 | 61 | 110 | 61 | 61 | 59 |
| PENALTY1 | 1000 | 0 | 63 | 80 | —T— | —T— | 55 | —I— | 51 | 51 | 61 | —T— | —T— | —T— | —T— | 56 | 58 | 56 | 63 | 78 | 63 | 63 | 77 |
| PENALTY2 | 4 | 0 | 8 | 71 | 69 | 69 | 6 | 6 | 6 | 6 | 8 | 52 | 49 | 49 | 10 | 8 | 12 | 12 | 7 | 5 | 7 | 7 | 7 |
| PENALTY2 | 10 | 0 | 96 | 303 | 39 | 77 | 15 | 152 | 61 | 17 | 107 | 108 | 65 | 65 | 108 | 104 | 108 | 43 | 94 | 27 | 94 | 94 | 94 |
| PENALTY2 | 50 | 0 | 39 | 48 | 32 | 30 | 34 | 78 | 34 | 70 | 57 | 46 | 34 | 33 | 38 | 54 | 34 | 38 | 48 | 91 | 48 | 48 | 46 |
| PENALTY2 | 100 | 0 | 19 | 22 | 20 | 20 | 18 | 168 | 21 | 21 | 21 | 20 | 19 | 19 | 19 | 19 | 19 | 19 | 21 | 92 | 20 | 21 | 20 |
| PENALTY3 | 50 | 0 | 22 | —S— | —S— | —S— | 19 | —I— | —S— | 24 | —S— | 21 | 23 | 28 | —S— | ( 375) | —S— | 24 | —I— | —S— | —S— | 109 | —S— |
| PENALTY3 | 100 | 0 | —S— | —S— | —S— | —S— | 25 | —I— | 25 | —S— | 24 | 30 | —S— | 32 | —S— | —I— | 27 | —S— | —I— | —T— | —S— | 124 | —S— |
| PENTAGON | 6 | 15 | 10 | 71 | 69 | 10 | 8 | 16 | 10 | 9 | 15 | 14 | 7 | 6 | 7 | 10 | 10 | 10 | 29 | —I— | 33 | 30 | 30 |
| POWELLBS | 2 | 0 | 47 | 47 | 46 | 43 | 47 | 477 | 45 | 47 | 47 | 51 | 44 | 42 | 47 | 47 | 47 | 47 | 47 | 47 | 47 | 48 | —S— |
| POWELLSG | 4 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 8 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 16 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 20 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 36 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 40 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 60 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 80 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 100 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 500 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 1000 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 5000 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 18 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 10000 | 0 | 15 | 17 | 15 | 15 | 15 | 31 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 18 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSQ | 2 | 0 | 4 | 21 | 4 | 4 | 4 | 71 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 22 | 4 | 12 | 14 | 20 | 20 | 20 |
| POWER | 10 | 0 | 16 | 17 | 16 | 16 | 16 | 36 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 13 | 16 | 16 | 16 |
| POWER | 20 | 0 | 17 | 19 | 18 | 18 | 18 | 73 | 18 | 18 | 17 | 17 | 18 | 18 | 18 | 17 | 18 | 17 | 17 | 14 | 17 | 17 | 17 |
| POWER | 30 | 0 | 18 | 20 | 19 | 19 | 19 | 119 | 19 | 19 | 18 | 18 | 19 | 19 | 19 | 18 | 19 | 18 | 18 | 15 | 18 | 18 | 18 |
| POWER | 50 | 0 | 19 | 21 | 20 | 20 | 20 | 235 | 20 | 20 | 20 | 19 | 20 | 20 | 20 | 19 | 20 | 19 | 20 | 16 | 20 | 20 | 20 |
| POWER | 75 | 0 | 20 | 22 | 21 | 21 | 22 | 413 | 21 | 21 | 20 | 20 | 21 | 21 | 21 | 20 | 22 | 20 | 21 | 17 | 21 | 21 | 21 |
| POWER | 100 | 0 | 22 | 23 | 22 | 22 | 22 | 623 | 22 | 22 | 21 | 21 | 22 | 22 | 22 | 22 | 23 | 21 | 22 | 18 | 22 | 22 | 22 |
| POWER | 500 | 0 | 26 | 27 | 27 | 27 | 26 | —I— | 26 | 26 | 26 | 25 | 26 | 26 | 26 | 26 | 28 | 26 | 25 | 21 | 25 | 25 | 25 |
| POWER | 1000 | 0 | 27 | 28 | —T— | —T— | 28 | —I— | 27 | 27 | 27 | —T— | —T— | —T— | —T— | 27 | 30 | 27 | 27 | 22 | 27 | 27 | 27 |
| PROBPENL | 10 | 0 | 102 | 102 | ( 2) | —I— | ( 45) | ( 6) | ( 2) | ( 2) | ( 19) | ( 3) | ( 2) | ( 3) | ( 53) | 99 | ( 2) | ( 38) | ( 3) | ( 3) | ( 2) | ( 2) | ( 2) |
| PROBPENL | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 2 | 2 |
| PROBPENL | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 3 | 3 | 2 | 2 | 2 |
| PROBPENL | 500 | 0 | 1 | —S— | 1 | 1 | 1 | 8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 3 | 3 | 2 | 2 | 2 |
| PRODPL0 | 60 | 29 | —S— | —S— | —I— | 937 | 34 | 120 | 31 | 35 | —S— | 36 | 46 | 53 | 40 | 35 | —S— | —S— | 42 | 684 | —S— | 41 | 81 |
| PRODPL1 | 60 | 29 | 65 | 65 | —I— | —I— | 63 | 280 | 61 | 70 | 61 | 65 | 72 | 53 | 73 | 71 | 68 | 62 | 66 | —I— | 75 | 69 | 162 |
| PSPDOC | 4 | 0 | 6 | 6 | 6 | 2 | 6 | 5 | 5 | 6 | 6 | 5 | 6 | 6 | 6 | 7 | 8 | 2 | 2 | 2 | 2 | 2 | 6 |
| QUARTC | 25 | 0 | 21 | 24 | 21 | 21 | 21 | 927 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 22 | 21 | 21 | 21 | 21 | 21 | 21 |
| QUARTC | 100 | 0 | 26 | 34 | 26 | 26 | 26 | —I— | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 28 | 26 | 26 | 26 | 26 | 26 | 26 |
| QUARTC | 500 | 0 | 33 | 41 | 32 | 32 | 33 | —I— | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 36 | 33 | 33 | 33 | 33 | 33 | 33 |
| QUARTC | 1000 | 0 | 35 | 45 | 35 | 35 | 35 | —I— | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 35 | 39 | 35 | 35 | 35 | 35 | 35 | 35 |
| QUARTC | 5000 | 0 | 42 | 54 | 41 | 41 | 42 | —I— | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 47 | 42 | 42 | 42 | 42 | 42 | 42 |
| QUARTC | 10000 | 0 | 45 | 57 | ( 44) | ( 44) | 45 | —I— | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 50 | 45 | 45 | 45 | 45 | 45 | 45 |

Number of minor iterations ( 14 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| READING1 | 202 | 100 | 768 | —F— | —I— | —I— | 302 | 217 | —I— | —I— | 664 | 391 | —I— | 414 | —I— | 746 | 674 | 322 | —I— | —I— | 793 | —I— | —I— |
| READING2 | 303 | 200 | 20 | 372 | —I— | —I— | —T— | 46 | 16 | 15 | 20 | 34 | 38 | 34 | 12 | 17 | 28 | 10 | 20 | 20 | 20 | 20 | 20 |
| READING3 | 202 | 101 | —I— | —S— | —I— | —I— | 615 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 521 | —I— | —I— | —I— | —I— | —I— |
| RECIPE | 3 | 0 | 16 | 16 | 16 | 16 | 16 | 50 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 42 | —I— | 22 | 14 | 14 |
| ROSENBR | 2 | 0 | 10 | 10 | 10 | 10 | 9 | 34 | 15 | 10 | 10 | 15 | 10 | 10 | 10 | 10 | 11 | 11 | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) |
| S277-280 | 4 | 4 | 16 | 16 | 22 | 11 | 10 | 48 | 9 | 8 | 16 | 12 | 10 | 11 | 18 | 12 | 14 | 17 | 16 | 16 | 16 | 16 | 16 |
| S277-280 | 6 | 6 | 20 | 20 | —I— | 155 | 11 | 52 | 15 | 13 | 10 | 12 | 12 | 14 | 14 | 14 | 17 | 16 | 20 | 20 | 20 | 20 | 20 |
| S277-280 | 8 | 8 | 9 | 9 | —I— | 16 | 11 | 31 | 11 | 10 | 10 | 20 | 13 | 12 | 19 | 16 | 19 | 9 | 9 | 9 | 9 | 9 | 9 |
| S277-280 | 10 | 10 | 18 | 15 | —I— | 8 | 9 | 27 | 8 | 11 | 12 | 19 | 12 | 798 | 16 | 19 | 21 | 13 | 18 | 18 | 18 | 18 | 18 |
| S308 | 2 | 0 | 10 | 10 | 10 | 10 | 9 | 17 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 10 | 19 | 18 | 10 | 9 | 11 |
| S316-322 | 2 | 1 | 23 | 23 | 23 | 23 | 23 | ( 57) | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 26 | 23 | 23 | 25 | 23 | 23 | 23 |
| S316-322 | 2 | 1 | 27 | 27 | 26 | 26 | 27 | ( 58) | 30 | 27 | 27 | 29 | 27 | 27 | 27 | 27 | 27 | 28 | 28 | 67 | 28 | 28 | 28 |
| S316-322 | 2 | 1 | ( 30) | ( 30) | ( 27) | ( 27) | ( 28) | 59 | ( 31) | ( 30) | ( 30) | ( 30) | ( 30) | ( 30) | ( 30) | ( 30) | ( 31) | ( 30) | ( 30) | ( 83) | ( 30) | ( 30) | ( 30) |
| S316-322 | 2 | 1 | ( 30) | ( 30) | ( 28) | ( 28) | ( 29) | ( 60) | ( 31) | ( 30) | ( 30) | 31 | ( 30) | ( 30) | ( 30) | ( 31) | ( 32) | 31 | ( 30) | ( 104) | ( 30) | ( 30) | ( 30) |
| S316-322 | 2 | 1 | ( 32) | ( 32) | ( 28) | ( 28) | ( 29) | 63 | ( 32) | ( 32) | ( 32) | ( 32) | ( 32) | ( 32) | ( 32) | ( 32) | ( 32) | ( 31) | ( 31) | ( 111) | ( 31) | ( 31) | ( 31) |
| S316-322 | 2 | 1 | ( 34) | ( 34) | ( 33) | ( 29) | ( 30) | 64 | ( 35) | ( 34) | ( 34) | ( 35) | ( 34) | ( 34) | ( 34) | ( 33) | ( 33) | ( 33) | ( 33) | ( 122) | ( 33) | ( 33) | ( 33) |
| S316-322 | 2 | 1 | ( 34) | ( 34) | ( 34) | ( 32) | ( 31) | ( 70) | 35 | ( 34) | ( 34) | ( 35) | ( 34) | ( 34) | ( 34) | ( 34) | ( 37) | ( 35) | 34 | —I— | 34 | 34 | 34 |
| SCHMVETT | 3 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 40 | 13 | 7 | 7 |
| SCHMVETT | 10 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 59 | 16 | 10 | 10 |
| SCHMVETT | 100 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 6 | —S— | 45 | 10 | 17 |
| SCHMVETT | 500 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 11 | —E— | 28 | 10 | 43 |
| SCHMVETT | 1000 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 12 | 3 | 18 | —S— | 28 | 11 | 12 |
| SCHMVETT | 5000 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 21 | —T— | 26 | 12 | 26 |
| SCHMVETT | 10000 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 21 | —T— | 31 | 11 | 13 |
| SEMICON1 | 12 | 10 | 117 | —S— | —S— | —S— | —F— | —F— | —S— | —S— | 117 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —F— | —S— | —S— | —S— |
| SEMICON1 | 52 | 50 | 491 | 219 | 391 | 225 | —F— | —F— | 436 | 486 | 491 | 702 | 324 | 702 | 551 | —F— | —F— | 258 | —F— | —F— | 476 | 528 | —F— |
| SEMICON1 | 102 | 100 | 986 | 456 | —F— | 294 | —F— | —F— | 814 | 945 | 984 | 652 | 589 | 652 | 873 | —F— | —F— | 335 | —F— | —F— | 745 | 956 | —F— |
| SEMICON1 | 502 | 500 | 763 | 763 | —F— | 506 | —F— | —F— | —F— | —F— | 763 | 729 | 846 | 729 | —F— | —F— | —F— | 473 | —F— | —F— | 958 | 791 | —F— |
| SEMICON2 | 12 | 10 | 39 | —S— | 38 | 48 | 281 | 855 | 75 | 39 | 39 | 38 | 38 | 38 | 38 | 54 | 77 | 49 | 167 | 237 | 65 | 65 | 65 |
| SEMICON2 | 52 | 50 | 93 | 70 | 94 | 78 | 478 | —F— | 191 | 194 | 93 | 90 | 103 | 90 | 96 | 133 | 96 | 77 | —F— | —F— | 100 | 100 | —F— |
| SEMICON2 | 102 | 100 | 118 | 95 | 110 | 97 | 359 | —F— | 171 | 245 | 118 | 118 | 118 | 118 | 118 | 160 | 117 | 98 | —F— | —F— | 122 | 122 | 122 |
| SEMICON2 | 502 | 500 | 117 | 114 | 117 | 117 | —T— | —F— | —T— | 216 | 117 | 117 | 117 | 117 | 117 | 136 | 124 | 117 | —F— | —F— | 180 | 180 | —F— |
| SEMICON2 | 1002 | 1000 | 134 | 100 | 134 | 134 | —T— | —F— | —T— | 163 | 134 | 134 | 134 | 134 | 134 | 134 | 147 | 134 | —F— | —F— | 201 | 201 | 201 |
| SIMPLLPA | 2 | 2 | 4 | 4 | 4 | 4 | 4 | 10 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| SIMPLLPB | 2 | 3 | 3 | 3 | 4 | 3 | 4 | 10 | 4 | 3 | 3 | 5 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| SINQUAD | 5 | 0 | 11 | 11 | 11 | 11 | 19 | 33 | 12 | 23 | 11 | 26 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| SINQUAD | 50 | 0 | 38 | 38 | 11 | 11 | 26 | 17 | 44 | 44 | 39 | 44 | 11 | 11 | 11 | 42 | 40 | 34 | 54 | 51 | 41 | 41 | 41 |
| SINQUAD | 100 | 0 | 56 | 56 | 11 | 11 | 35 | 22 | 59 | 62 | 69 | 75 | 11 | 11 | 11 | 63 | 62 | 63 | 70 | 64 | 66 | 66 | 66 |
| SINQUAD | 500 | 0 | 97 | 97 | 11 | 11 | 48 | 43 | 112 | 106 | 104 | 91 | 11 | 11 | 32 | 113 | 111 | ( 63) | 108 | 97 | 110 | 110 | 116 |
| SINQUAD | 1000 | 0 | 131 | 131 | 11 | 11 | 73 | 61 | 135 | 131 | 138 | 124 | 11 | 11 | 36 | 121 | 120 | 118 | 147 | 151 | 149 | 149 | 137 |
| SINQUAD | 5000 | 0 | ( 175) | ( 175) | 11 | 11 | ( 105) | —I— | 251 | 245 | 257 | 206 | 12 | 12 | 51 | 228 | 228 | —T— | 246 | 209 | 237 | 237 | 207 |
| SINQUAD | 10000 | 0 | 270 | 270 | 18 | 16 | 149 | —I— | 302 | 342 | 237 | —T— | 18 | 17 | —T— | 299 | 338 | —T— | 322 | 278 | 321 | 321 | 314 |
| SISSER | 2 | 0 | 12 | 14 | 12 | 12 | 12 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 12 | 12 | 10 |
| SNAIL | 2 | 0 | 90 | 90 | 83 | 84 | 92 | 84 | 86 | 90 | 90 | 98 | 90 | 82 | 83 | 89 | 66 | 78 | 133 | —I— | 102 | 261 | 287 |
| SPANHYD | 97 | 33 | 34 | 108 | —I— | 105 | 19 | —I— | 33 | 29 | 26 | —I— | 38 | 607 | 38 | 22 | 30 | 28 | 130 | —I— | —I— | 146 | —I— |
| SPMSQRT | 28 | 0 | 12 | 17 | 14 | 13 | 12 | 16 | 12 | 12 | 12 | 14 | 12 | 14 | 12 | 15 | 12 | 13 | 13 | —I— | 10 | 11 | 13 |
| SPMSQRT | 100 | 0 | 14 | 30 | 16 | 15 | 12 | 13 | 13 | 13 | 14 | 16 | 16 | 17 | 14 | 17 | 15 | 14 | 19 | —I— | 12 | 15 | 48 |
| SPMSQRT | 499 | 0 | 19 | 43 | 19 | 14 | 16 | 24 | 17 | 23 | 19 | 21 | 20 | 20 | 18 | —I— | 21 | 14 | 24 | —S— | 22 | 18 | 63 |
| SPMSQRT | 1000 | 0 | 21 | 50 | 24 | 14 | 17 | 24 | 15 | 18 | 21 | 22 | 19 | 23 | 19 | —I— | 22 | 14 | 23 | —I— | 19 | 19 | 150 |
| SPMSQRT | 4999 | 0 | 21 | —T— | 34 | 20 | 19 | —T— | 24 | 20 | 21 | 27 | 23 | 26 | 19 | —T— | 29 | 17 | 54 | —I— | 17 | 23 | 72 |
| SPMSQRT | 10000 | 0 | 24 | —T— | 50 | —T— | 20 | —T— | 27 | 28 | 24 | 29 | 21 | 36 | 19 | —T— | 34 | —T— | 48 | —T— | 23 | 34 | 140 |
| SROSENBR | 10 | 0 | 6 | 6 | 6 | 6 | 10 | 10 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 50 | 0 | 6 | 6 | 6 | 6 | 10 | 10 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 100 | 0 | 6 | 6 | 6 | 6 | 10 | 10 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 500 | 0 | 10 | 10 | 6 | 6 | 10 | 10 | 6 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 7 | 10 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 1000 | 0 | 10 | 10 | 6 | 6 | 10 | 10 | 6 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 10 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 5000 | 0 | 10 | 10 | 6 | 6 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 7 | 10 | 19 | 19 | 13 | 13 | 13 |
| SROSENBR | 10000 | 0 | 10 | 10 | 6 | 6 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | —T— | 24 | 24 | 13 | 13 | 13 |
| SSEBLIN | 194 | 72 | 64 | 66 | —I— | —I— | 52 | —I— | 69 | 70 | 64 | —I— | 68 | —I— | 55 | 63 | 67 | 62 | 66 | 65 | 63 | 64 | 65 |

Number of minor iterations ( 15 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSEBNLN | 194 | 96 | 65 | 61 | —I— | —I— | 52 | —I— | 68 | 69 | 65 | 104 | 66 | 92 | 57 | 63 | 67 | 64 | 65 | 65 | 67 | 66 | 65 |
| STEENBRA | 432 | 108 | 51 | 58 | —I— | —I— | 30 | —I— | 52 | 48 | 52 | —I— | 31 | —I— | —I— | 61 | 54 | 31 | 57 | 50 | 45 | 56 | —I— |
| STEENBRB | 468 | 108 | —I— | —I— | —I— | 461 | —I— | ( 855) | 414 | 151 | 385 | —E— | 116 | —I— | 351 | 143 | —I— | 399 | —I— | —I— | —I— | 622 | —I— |
| STEENBRC | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 343) | —I— | —I— | —I— | —E— | ( 115) | —I— | 289 | —I— | —I— | 99 | —I— | —I— | —I— | 615 | —I— |
| STEENBRD | 468 | 108 | —I— | 507 | —I— | —I— | —I— | ( 560) | ( 184) | —I— | —I— | —E— | ( 141) | —E— | 747 | —I— | —I— | ( 110) | —I— | —I— | ( 912) | ( 535) | —I— |
| STEENBRE | 540 | 126 | 740 | —I— | —I— | —I— | —I— | ( 705) | —I— | —I— | —I— | —I— | 168 | —E— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 679 | —I— |
| STEENBRF | 468 | 108 | —I— | —I— | —I— | 830 | —I— | ( 318) | 111 | 156 | —I— | —E— | 124 | ( 237) | 192 | 789 | —I— | 82 | —I— | —I— | 516 | 537 | —I— |
| STEENBRG | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 488) | —I— | —I— | —I— | —E— | 193 | —E— | 455 | —I— | —I— | 119 | —I— | —I— | —I— | ( 813) | —I— |
| SVANBERG | 10 | 10 | 53 | 53 | —I— | 34 | 36 | 26 | 38 | 48 | 43 | 65 | 59 | 44 | 42 | 51 | 102 | 42 | 56 | 110 | 56 | 56 | 57 |
| SVANBERG | 20 | 20 | 56 | 56 | 110 | 35 | 41 | 26 | 57 | 47 | 59 | 57 | 76 | 55 | 67 | 52 | 63 | 41 | 52 | 139 | 52 | 52 | 52 |
| SVANBERG | 30 | 30 | 74 | 74 | 277 | 37 | 46 | 27 | 55 | 55 | 55 | 52 | 117 | 75 | 93 | 54 | 170 | 45 | 75 | 255 | 75 | 75 | 63 |
| SVANBERG | 40 | 40 | 69 | 69 | 122 | 43 | 49 | 28 | 51 | 46 | 51 | 60 | 90 | 65 | 94 | 51 | 130 | 50 | 62 | 271 | 62 | 62 | 62 |
| SVANBERG | 50 | 50 | 63 | 63 | —I— | 46 | 39 | 29 | 45 | 53 | 68 | 89 | 93 | 82 | 89 | 69 | 114 | 48 | 75 | 406 | 73 | 73 | 68 |
| SVANBERG | 60 | 60 | 68 | 68 | 763 | 47 | 37 | 30 | 51 | 49 | 62 | 66 | 133 | 63 | 92 | 71 | 69 | 49 | 60 | 447 | 62 | 60 | 58 |
| SVANBERG | 70 | 70 | 70 | 70 | 235 | 46 | 43 | 30 | 50 | 55 | 67 | 81 | 119 | 91 | 86 | 50 | 181 | 47 | 78 | 522 | 71 | 75 | 73 |
| SVANBERG | 80 | 80 | 68 | 68 | 462 | 49 | 48 | 33 | 53 | 53 | 66 | 65 | 86 | 76 | 80 | 72 | 105 | 51 | 57 | 540 | 60 | 59 | 61 |
| SVANBERG | 90 | 90 | 61 | 61 | 223 | 49 | 51 | 34 | 50 | 73 | 71 | 71 | 106 | 83 | 95 | 69 | 195 | 51 | 59 | 517 | 64 | 60 | 56 |
| SVANBERG | 100 | 100 | 75 | 75 | 967 | 53 | 51 | 37 | 69 | 78 | 82 | 82 | 107 | 73 | 92 | 79 | 140 | 55 | 69 | 503 | 68 | 69 | 70 |
| SVANBERG | 500 | 500 | 84 | 84 | —I— | —T— | 54 | 40 | 59 | 76 | 101 | 88 | 129 | 119 | 100 | 95 | 209 | 64 | 103 | 950 | 103 | 97 | 105 |
| SVANBERG | 1000 | 1000 | 100 | 100 | —I— | —T— | —T— | 41 | 77 | —T— | 137 | 112 | 155 | 135 | 81 | 73 | 155 | 69 | 111 | 768 | 103 | 94 | 153 |
| SVANBERG | 5000 | 5000 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| TAME | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TENBARS1 | 18 | 9 | 797 | 500 | —I— | —I— | 491 | —I— | —S— | 473 | —S— | 914 | —I— | 318 | 551 | —S— | 472 | —S— | —I— | —I— | 333 | —S— | —I— |
| TENBARS2 | 18 | 8 | 365 | 539 | —I— | —I— | 270 | —I— | 553 | 328 | 480 | 331 | —I— | 351 | 588 | —S— | 337 | 336 | 609 | —I— | 360 | 308 | —I— |
| TENBARS3 | 18 | 8 | 238 | 395 | —I— | —I— | 180 | —I— | 431 | 220 | 395 | 254 | —I— | 321 | 546 | 195 | 252 | 359 | 437 | —I— | 238 | 237 | —I— |
| TENBARS4 | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| TOINTGOR | 50 | 0 | 9 | 11 | 8 | 8 | 8 | 56 | 9 | 9 | 9 | 9 | 8 | 8 | 9 | 9 | 11 | 9 | 9 | 9 | 9 | 9 | 9 |
| TOINTGSS | 10 | 0 | 2 | 2 | 0 | 2 | 14 | 22 | ( 10) | 2 | 2 | 2 | 2 | 2 | 2 | 14 | ( 11) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 50 | 0 | 2 | 2 | 2 | 2 | ( 12) | 8 | ( 9) | 2 | 2 | 2 | 2 | 2 | 2 | 12 | ( 11) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 100 | 0 | 2 | 2 | 2 | 2 | ( 8) | ( 12) | ( 12) | 2 | 2 | 2 | 2 | 2 | 2 | ( 7) | ( 13) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 500 | 0 | 2 | 2 | 2 | 2 | ( 8) | ( 10) | ( 6) | 2 | 2 | 2 | 2 | 2 | 2 | 11 | ( 13) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 1000 | 0 | 2 | 2 | 2 | 2 | ( 8) | ( 9) | ( 6) | 2 | 2 | 2 | 2 | 2 | 2 | 13 | ( 12) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 5000 | 0 | 2 | 2 | 2 | 2 | ( 8) | ( 10) | ( 5) | 2 | 2 | 2 | 2 | 2 | 2 | 13 | ( 13) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 10000 | 0 | 2 | 2 | 2 | 2 | 8 | ( 11) | ( 5) | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 12 | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTPSP | 50 | 0 | 23 | 23 | 25 | 24 | 38 | 30 | 29 | 26 | 23 | 29 | 25 | 25 | 25 | 32 | 39 | 25 | 23 | 23 | 23 | 23 | 23 |
| TOINTQOR | 50 | 0 | 6 | 8 | 4 | 4 | 5 | 18 | 6 | 6 | 6 | 6 | 4 | 4 | 5 | 6 | 8 | 7 | 6 | 6 | 6 | 6 | 6 |
| TORSIONA | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 12 | 3 | 3 | 3 |
| TORSIONA | 100 | 0 | 3 | 4 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 6 | 52 | 6 | 6 | 6 |
| TORSIONA | 484 | 0 | 7 | 8 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 11 | 290 | 11 | 11 | 11 |
| TORSIONA | 1024 | 0 | 10 | 11 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 10 | 10 | 10 | 10 | 946 | 10 | 10 | 12 |
| TORSIONA | 5476 | 0 | 23 | 24 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 25 | —I— | 25 | 25 | 25 |
| TORSIONA | 10000 | 0 | 31 | 32 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 35 | —I— | 35 | 35 | 35 |
| TORSIONA | 14884 | 0 | 37 | 40 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 37 | 42 | —T— | 42 | 42 | 40 |
| TORSIONB | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 13 | 2 | 2 | 2 |
| TORSIONB | 100 | 0 | 4 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 46 | 5 | 5 | 5 |
| TORSIONB | 484 | 0 | 5 | 6 | 11 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 7 | 226 | 7 | 7 | 7 |
| TORSIONB | 1024 | 0 | 5 | 7 | 23 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 9 | 499 | 9 | 9 | 9 |
| TORSIONB | 5476 | 0 | 9 | 11 | 145 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 4 | 5 | 10 | 17 | —I— | 17 | 17 | 17 |
| TORSIONB | 10000 | 0 | 12 | 14 | 248 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 7 | 7 | 13 | 23 | —I— | 23 | 23 | 23 |
| TORSIONB | 14884 | 0 | 15 | 17 | —T— | —I— | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 14 | —T— | —T— | —T— | 15 | 27 | —T— | 27 | 27 | 27 |
| TORSIONC | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONC | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 15 | 4 | 4 | 4 |
| TORSIONC | 484 | 0 | 4 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 81 | 5 | 5 | 7 |
| TORSIONC | 1024 | 0 | 5 | 6 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 8 | 154 | 8 | 8 | 8 |
| TORSIONC | 5476 | 0 | 11 | 13 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 14 | —I— | 14 | 14 | 14 |
| TORSIONC | 10000 | 0 | 15 | 17 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 20 | —I— | 20 | 20 | 20 |
| TORSIONC | 14884 | 0 | 19 | 21 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 19 | 25 | —I— | 25 | 25 | 23 |
| TORSIOND | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIOND | 100 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 16 | 3 | 3 | 3 |

Number of minor iterations ( 16 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TORSIOND | 484 | 0 | 4 | 5 | 5 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 76 | 5 | 5 | 5 |
| TORSIOND | 1024 | 0 | 5 | 6 | 9 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 6 | 234 | 6 | 6 | 6 |
| TORSIOND | 5476 | 0 | 9 | 11 | 33 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 5 | 6 | 9 | 10 | —I— | 10 | 10 | 10 |
| TORSIOND | 10000 | 0 | 11 | 14 | 78 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 5 | —T— | 11 | 13 | —I— | 13 | 13 | 13 |
| TORSIOND | 14884 | 0 | 14 | 16 | 117 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | —T— | —T— | 14 | 15 | —I— | 15 | 15 | 15 |
| TORSIONE | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 484 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 21 | 4 | 4 | 4 |
| TORSIONE | 1024 | 0 | 3 | 4 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 6 | 103 | 6 | 6 | 6 |
| TORSIONE | 5476 | 0 | 6 | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 270 | 6 | 6 | 10 |
| TORSIONE | 10000 | 0 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 13 | 758 | 13 | 13 | 13 |
| TORSIONE | 14884 | 0 | 9 | 11 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 13 | —I— | 13 | 13 | 12 |
| TORSIONF | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONF | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONF | 484 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 5 | 2 | 3 | 19 | 3 | 3 | 3 |
| TORSIONF | 1024 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 4 | 4 | 85 | 4 | 4 | 4 |
| TORSIONF | 5476 | 0 | 5 | 7 | 11 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 5 | 7 | 539 | 7 | 7 | 7 |
| TORSIONF | 10000 | 0 | 7 | 9 | 13 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 9 | 7 | 8 | 807 | 8 | 8 | 8 |
| TORSIONF | 14884 | 0 | 7 | 11 | 29 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | —T— | —T— | 7 | 9 | —I— | 9 | 9 | 9 |
| TQUARTIC | 5 | 0 | 1 | 1 | 9 | 9 | 9 | 2 | 1 | 4 | 1 | 4 | 1 | 1 | 1 | 1 | 12 | 1 | 1 | 1 | 1 | 1 | 1 |
| TQUARTIC | 10 | 0 | 5 | 5 | 17 | 11 | 10 | 3 | 1 | 5 | 1 | 5 | 1 | 1 | 1 | 5 | 13 | 6 | 5 | 5 | 5 | 5 | 5 |
| TQUARTIC | 50 | 0 | 10 | 10 | 11 | 11 | 9 | 8 | 1 | 7 | 19 | 19 | 1 | 1 | 1 | 20 | 13 | 5 | 10 | 9 | 10 | 10 | 10 |
| TQUARTIC | 100 | 0 | 12 | 12 | 13 | 13 | 11 | 13 | 1 | 9 | 16 | 15 | 1 | 1 | 1 | 12 | 14 | 7 | 12 | 10 | 12 | 12 | 12 |
| TQUARTIC | 500 | 0 | 15 | 15 | 14 | 10 | 12 | 30 | 1 | 12 | 13 | 1 | 1 | 1 | 1 | 15 | 14 | 7 | 15 | 15 | 15 | 15 | 15 |
| TQUARTIC | 1000 | 0 | 12 | 12 | 13 | 11 | 13 | 43 | 1 | 18 | 15 | 1 | 1 | 1 | 1 | 12 | 11 | 7 | 12 | 13 | 12 | 12 | 12 |
| TQUARTIC | 5000 | 0 | 20 | 20 | 11 | —T— | 12 | 98 | 1 | 12 | 18 | 1 | 1 | 1 | 1 | 20 | 28 | 13 | 19 | 18 | 19 | 19 | 19 |
| TQUARTIC | 10000 | 0 | 18 | 18 | 13 | —T— | 12 | 139 | 1 | 12 | 23 | 1 | 1 | 1 | 1 | 18 | 66 | 13 | 18 | 19 | 18 | 18 | 18 |
| TRIDIA | 10 | 0 | 1 | 1 | 1 | 1 | 5 | 11 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 20 | 0 | 2 | 1 | 2 | 2 | 4 | 15 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 30 | 0 | 2 | 1 | 2 | 2 | 4 | 19 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 50 | 0 | 2 | 1 | 2 | 2 | 4 | 24 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 100 | 0 | 2 | 1 | 2 | 2 | 4 | 33 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 500 | 0 | 2 | 1 | 2 | 2 | 4 | 72 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 1000 | 0 | 2 | 1 | 2 | 2 | 4 | 101 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 5000 | 0 | 2 | 1 | 2 | 2 | 4 | 226 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 7 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 10000 | 0 | 2 | 1 | 2 | 2 | 4 | 318 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIGGER | 7 | 6 | 21 | —F— | 35 | 17 | —S— | —I— | —I— | —I— | 21 | 21 | 18 | 32 | 36 | 21 | —S— | 20 | 19 | 14 | 22 | 22 | 22 |
| VARDIM | 10 | 0 | 14 | 16 | 14 | 14 | 14 | 279 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| VARDIM | 50 | 0 | 22 | 26 | 22 | 22 | 22 | —I— | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 |
| VARDIM | 100 | 0 | 25 | 31 | 25 | 25 | 25 | —I— | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | 25 | 25 | 25 | 25 | 25 | 25 |
| VAREIGVL | 10 | 0 | 21 | 21 | 25 | 15 | 10 | 28 | 13 | 16 | 17 | 14 | 34 | 21 | 12 | 17 | 14 | 14 | 21 | 6 | 16 | 17 | 18 |
| VAREIGVL | 50 | 0 | 13 | 16 | 13 | 13 | 11 | 26 | 15 | 15 | 13 | 13 | 13 | 13 | 12 | 13 | 13 | 13 | 10 | 7 | 12 | 15 | 17 |
| VAREIGVL | 100 | 0 | 12 | 13 | 12 | 12 | 11 | 15 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 19 | 12 | 11 | —I— | 11 | 12 | 29 |
| VAREIGVL | 500 | 0 | 12 | 14 | 12 | 12 | 12 | 15 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 14 | 12 | 17 | —I— | 11 | 11 | 21 |
| VAREIGVL | 1000 | 0 | 12 | 14 | 12 | 12 | 12 | 15 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 15 | 13 | 16 | —I— | 12 | 12 | 16 |
| VAREIGVL | 5000 | 0 | 13 | 14 | —M— | —M— | 13 | 18 | 13 | 13 | 13 | —M— | —M— | —M— | —M— | 13 | 17 | 13 | 12 | —T— | 12 | 12 | 22 |
| WATSON | 12 | 0 | 8 | 11 | —I— | 10 | 9 | 8 | 9 | 8 | 8 | 11 | 26 | 8 | 7 | 8 | 7 | 9 | 159 | 159 | 21 | 18 | 19 |
| WATSON | 31 | 0 | 10 | 466 | —I— | 94 | 9 | 122 | 11 | 11 | 9 | 25 | 11 | 57 | 9 | 10 | 11 | 10 | 14 | 14 | 16 | 20 | 20 |
| WOODS | 4 | 0 | 22 | 30 | 21 | 23 | 23 | 282 | 21 | 26 | 22 | 21 | 22 | 22 | 22 | 28 | 23 | 22 | 15 | 15 | 22 | 22 | 22 |
| WOODS | 100 | 0 | 22 | 30 | 28 | 21 | 25 | 282 | 21 | 26 | 22 | 22 | 22 | 22 | 22 | 26 | 25 | 21 | 14 | 14 | 22 | 22 | 22 |
| WOODS | 1000 | 0 | 25 | 27 | 33 | 21 | 23 | 282 | 22 | 22 | 25 | 25 | 25 | 25 | 25 | 26 | 21 | 24 | 14 | 14 | 25 | 25 | 25 |
| WOODS | 10000 | 0 | 25 | 27 | 28 | —T— | 23 | 282 | 22 | 22 | 25 | 25 | 25 | 25 | 25 | 22 | 25 | —T— | 16 | 16 | 25 | 25 | 25 |
| ZANGWIL2 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| ZANGWIL3 | 3 | 0 | 7 | 7 | 7 | 7 | 7 | 245 | 7 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| ZIGZAG | 64 | 50 | 35 | 35 | —I— | 173 | 28 | 60 | 38 | 42 | 42 | 37 | 36 | 35 | 46 | 39 | 35 | 35 | 39 | 45 | 36 | 45 | 37 |
| ZIGZAG | 304 | 250 | 81 | 275 | —I— | —I— | 191 | 478 | 86 | 82 | 97 | 97 | 78 | —I— | 79 | 84 | 86 | 80 | 217 | 218 | 89 | 83 | 82 |
| ZIGZAG | 604 | 500 | 90 | —I— | —I— | —I— | —T— | 948 | 117 | 128 | 95 | 103 | 85 | —I— | 92 | 90 | 90 | 89 | —S— | —S— | 94 | 90 | 87 |
| ZIGZAG | 3004 | 2500 | —T— | —T— | —T— | —T— | —T— | —I— | —T— | —T— | 164 | —T— | 90 | —T— | 103 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |

# 4 Number of gradient evaluations

This section presents the number of gradient evaluations required by the 21 algorithmic variants for convergence. The column headings in the tables refer to these variants, using the terminology of the paper. Other conventions are as in the previous section.

Number of gradient evaluations ( 1 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGG | 163 | 488 | —T— | —T— | —I— | —I— | —T— | —I— | —S— | —S— | —T— | —I— | —S— | —I— | —T— | —S— | —I— | —S— | —T— | —T— | —T— | —T— | —T— |
| AIRCRFTA | 8 | 5 | 5 | 5 | 5 | 5 | 5 | 39 | 6 | 6 | 5 | 5 | 14 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 5 | 5 | 5 |
| AIRCRFTB | 8 | 0 | 16 | 16 | 16 | 16 | 19 | 12 | 20 | 18 | 16 | 18 | 16 | 16 | 16 | 10 | 14 | 19 | 18 | —S— | 14 | 15 | 16 |
| ALJAZZAF | 3 | 1 | 24 | 24 | 25 | 25 | 25 | —I— | 25 | 24 | 24 | 25 | 24 | 24 | 24 | 24 | 24 | 24 | 32 | —I— | 32 | 32 | 33 |
| ARGAUSS | 3 | 0 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINA | 10 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINA | 100 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINB | 10 | 0 | 2 | 2 | 2 | 2 | 2 | 418 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINB | 50 | 0 | 3 | —S— | 3 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINB | 100 | 0 | 3 | —S— | 3 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 3 | 4 | 3 | —S— | —S— | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINC | 10 | 0 | 2 | 2 | 2 | 2 | 2 | 358 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARGLINC | 50 | 0 | 3 | —S— | 3 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGLINC | 100 | 0 | 3 | —S— | 3 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 3 | 5 | 3 | —S— | —S— | 3 | 3 | 3 | 3 | 3 | 3 |
| ARGTRIG | 10 | 0 | 8 | 8 | 10 | 7 | 10 | 16 | 8 | 8 | 9 | 7 | 9 | 7 | 8 | 7 | 6 | 7 | 6 | 6 | 8 | 8 | 8 |
| ARGTRIG | 50 | 0 | 8 | 8 | 11 | 5 | 6 | 9 | 16 | 16 | 7 | 7 | 5 | 6 | 6 | 8 | 12 | 6 | 6 | 6 | 6 | 6 | 6 |
| ARGTRIG | 100 | 0 | 12 | 12 | 9 | 5 | 6 | 11 | 15 | 20 | 10 | 6 | 5 | 6 | 7 | 12 | 13 | 7 | 6 | 6 | 6 | 6 | 6 |
| ARTIF | 12 | 0 | 11 | 8 | 13 | 10 | 11 | 8 | 12 | 11 | 11 | 12 | 11 | 12 | 12 | 13 | 15 | 10 | 7 | 7 | 9 | 9 | 9 |
| ARTIF | 52 | 0 | 17 | 20 | 22 | 13 | 28 | 12 | 19 | 17 | 17 | 20 | 19 | 20 | 21 | 16 | 19 | 14 | 11 | 11 | 9 | 9 | 9 |
| ARTIF | 102 | 0 | 25 | 32 | 29 | 16 | 185 | 78 | 21 | 24 | 25 | 41 | 31 | 41 | 27 | 28 | 25 | 16 | 30 | 30 | 17 | 17 | 17 |
| ARTIF | 502 | 0 | 25 | 30 | 67 | 17 | 36 | 23 | 22 | 25 | 25 | 43 | 31 | 43 | 30 | 22 | 26 | 18 | 36 | 36 | 18 | 18 | 18 |
| ARTIF | 1002 | 0 | 25 | 32 | 111 | 17 | 37 | 33 | 22 | 25 | 25 | 38 | 32 | 38 | 30 | 22 | 23 | 18 | 35 | 35 | 18 | 18 | 18 |
| ARTIF | 5002 | 0 | 25 | 38 | 274 | —T— | 36 | 38 | 22 | 25 | 25 | 53 | 30 | 53 | 29 | 25 | 32 | 18 | 36 | 36 | 17 | 17 | 17 |
| ARWHEAD | 100 | 0 | 6 | 6 | 6 | 6 | 6 | 30 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 6 |
| ARWHEAD | 500 | 0 | 6 | 6 | 6 | 6 | 6 | 62 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 |
| ARWHEAD | 1000 | 0 | 6 | 6 | 6 | 6 | 6 | 86 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| ARWHEAD | 5000 | 0 | 6 | 6 | 6 | 6 | 6 | 189 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 |
| BARD | 3 | 0 | 8 | 9 | 12 | 9 | 13 | 10 | 13 | 12 | 8 | 12 | 10 | 9 | 11 | 8 | 8 | 8 | 11 | —I— | 9 | 10 | 10 |
| BDEXP | 100 | 0 | 11 | 11 | 11 | 11 | 11 | 13 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 11 | 18 | 19 | 17 | 19 | 19 |
| BDEXP | 500 | 0 | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | 12 | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 14) | ( 11) | 18 | 19 | ( 17) | 18 | ( 18) |
| BDEXP | 1000 | 0 | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | 12 | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 15) | ( 11) | ( 18) | 19 | ( 17) | ( 18) | ( 17) |
| BDEXP | 5000 | 0 | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 12) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 11) | ( 16) | ( 11) | ( 18) | 19 | ( 17) | ( 20) | ( 20) |
| BDQRTIC | 100 | 0 | 12 | 9 | 12 | 12 | 13 | 102 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 11 | 11 | 11 | 11 | 11 |
| BDQRTIC | 500 | 0 | 12 | 11 | 12 | 12 | 13 | 223 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 14 | 12 | 11 | 11 | 11 | 11 | 11 |
| BDQRTIC | 1000 | 0 | 12 | 11 | 38 | 38 | 13 | 314 | 13 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 14 | 12 | 12 | 12 | 12 | 12 | —S— |
| BDVALUE | 12 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BDVALUE | 52 | 0 | 2 | 2 | 2 | 2 | 11 | 8 | 7 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BDVALUE | 102 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BDVALUE | 502 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BDVALUE | 1002 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 5002 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BEALE | 2 | 0 | 8 | —E— | 8 | 8 | 6 | 45 | 9 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 15 | 15 | 12 | 13 | 13 |
| BIGBANK | 2230 | 1112 | —T— | —T— | 137 | 28 | —T— | —I— | —T— | —T— | —T— | —T— | 40 | 40 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| BIGGS3 | 6 | 0 | 11 | 10 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 18 | —S— | 11 | 15 | 15 |
| BIGGS5 | 6 | 0 | 40 | 43 | —I— | 30 | 18 | 31 | 38 | ( 41) | 40 | 30 | 33 | 50 | 38 | 40 | 43 | 36 | 38 | —I— | ( 224) | 29 | 34 |
| BIGGS6 | 6 | 0 | 90 | 42 | 180 | 59 | 20 | —I— | 44 | 22 | 90 | 31 | 104 | 70 | ( 70) | 77 | 70 | 87 | ( 134) | —I— | 70 | 48 | 71 |
| BOOTH | 2 | 0 | 4 | 4 | 4 | 4 | 3 | 11 | 6 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| BOX2 | 3 | 0 | 7 | 18 | 6 | 6 | 6 | 16 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| BOX3 | 3 | 0 | 8 | 16 | 8 | 8 | 8 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 9 |
| BQPGAUSS | 2003 | 0 | 9 | —S— | —I— | 9 | 8 | 9 | 12 | 13 | 11 | 214 | 8 | 8 | 8 | 10 | 11 | 8 | —I— | —S— | 43 | 18 | —I— |
| BRATU1D | 13 | 0 | 6 | 6 | 6 | 6 | 7 | 14 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | —S— | —S— | 14 | 12 | 351 |
| BRATU1D | 77 | 0 | 8 | 8 | 8 | 8 | 9 | 188 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | —I— | —I— | 16 | 13 | —I— |
| BRATU1D | 103 | 0 | 9 | 8 | 9 | 9 | 10 | —I— | 11 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 11 | 9 | —I— | —I— | 15 | 13 | —I— |
| BRATU1D | 503 | 0 | 11 | 9 | 11 | —E— | 13 | —I— | 15 | 11 | 11 | 12 | 11 | 11 | 11 | 11 | 14 | 11 | —E— | —I— | —E— | 14 | —E— |
| BRATU1D | 1003 | 0 | 12 | —E— | 12 | 12 | 14 | —I— | 16 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 16 | 12 | —E— | —I— | —E— | 15 | —E— |
| BRATU2D | 49 | 25 | 5 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| BRATU2D | 100 | 64 | 4 | 5 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| BRATU2D | 484 | 400 | 4 | 6 | 3 | 3 | 3 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| BRATU2D | 1024 | 900 | 3 | 6 | 3 | 3 | 3 | 5 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| BRATU2D | 5184 | 4900 | 3 | 6 | —F— | —F— | —F— | 5 | 3 | 3 | 3 | —F— | —F— | —F— | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |

Number of gradient evaluations ( 2 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRATU3D | 27 | 1 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| BRATU3D | 125 | 27 | 5 | 5 | 5 | 5 | 5 | 8 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| BRATU3D | 512 | 216 | 5 | 5 | 4 | 4 | 4 | 8 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 7 | 5 | 5 | 5 | 5 | 5 | 5 |
| BRATU3D | 1000 | 512 | 4 | 5 | 4 | 4 | 4 | 8 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 4 | 7 | 5 | 4 | 4 | 4 | 4 | 5 |
| BRATU3D | 4913 | 3375 | 4 | 6 | 4 | 4 | 4 | 8 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 8 | 5 | 4 | 4 | 4 | 4 | 4 |
| BRIDGEND | 2734 | 2727 | —T— | —I— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —I— | —T— | 201 | —T— | —T— | —T— | —T— | —I— | —I— | —T— | —T— | —I— |
| BRITGAS | 450 | 360 | 93 | 109 | —I— | —I— | 58 | 42 | 57 | 91 | 82 | 377 | 154 | 48 | 70 | 102 | 92 | 53 | —I— | —I— | 97 | 123 | —I— |
| BRKMCC | 2 | 0 | 4 | 5 | 4 | 4 | 5 | 7 | 5 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| BROWNAL | 10 | 0 | 6 | 6 | 5 | 5 | 5 | 10 | 5 | 6 | 5 | 6 | 5 | 5 | 5 | 6 | 9 | 7 | 6 | 6 | 6 | 6 | 6 |
| BROWNAL | 50 | 0 | 4 | 4 | 4 | 4 | 4 | 9 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 7 | 5 | 5 | 5 | 5 | 5 | 5 |
| BROWNBS | 2 | 0 | 34 | 34 | —I— | —I— | 25 | 46 | 23 | 34 | 34 | 23 | 39 | 38 | 39 | 35 | 38 | 29 | 66 | —I— | 41 | 34 | 33 |
| BROWNDEN | 4 | 0 | 12 | 12 | 78 | 82 | 12 | —I— | 14 | 14 | 12 | 13 | 12 | 12 | 12 | 12 | 11 | 12 | 15 | 70 | 14 | 12 | —I— |
| BROYDN3D | 10 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| BROYDN3D | 50 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| BROYDN3D | 100 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| BROYDN3D | 500 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 5 | 5 | 8 | 8 | 8 |
| BROYDN3D | 1000 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 5 | 5 | 8 | 8 | 8 |
| BROYDN3D | 5000 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 6 | 5 | 5 | 8 | 8 | 8 |
| BROYDN3D | 10000 | 0 | 6 | 6 | 6 | 6 | 6 | 9 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 6 | 5 | 5 | 7 | 7 | 7 |
| BROYDN7D | 10 | 0 | 16 | 16 | ( 19) | 17 | 19 | ( 29) | ( 16) | 17 | 16 | 19 | 17 | ( 15) | ( 17) | 20 | 20 | 17 | ( 54) | ( 54) | 20 | 20 | 20 |
| BROYDN7D | 50 | 0 | ( 22) | ( 22) | ( 35) | ( 14) | ( 18) | ( 22) | ( 18) | 26 | ( 22) | ( 24) | ( 18) | ( 25) | ( 25) | ( 20) | ( 19) | ( 13) | ( 37) | ( 37) | ( 22) | ( 22) | ( 22) |
| BROYDN7D | 100 | 0 | ( 24) | ( 24) | ( 41) | ( 13) | ( 20) | ( 27) | ( 22) | 37 | ( 24) | ( 34) | ( 21) | ( 35) | ( 36) | ( 26) | ( 35) | ( 14) | ( 48) | ( 48) | ( 25) | ( 25) | ( 25) |
| BROYDN7D | 500 | 0 | ( 61) | ( 61) | ( 89) | ( 12) | ( 67) | ( 98) | ( 74) | 47 | ( 61) | ( 89) | ( 26) | ( 88) | ( 89) | ( 53) | ( 60) | ( 16) | ( 95) | ( 95) | ( 48) | ( 48) | ( 54) |
| BROYDN7D | 1000 | 0 | ( 98) | ( 98) | ( 117) | ( 14) | ( 116) | ( 214) | ( 131) | 49 | ( 98) | ( 175) | ( 32) | ( 72) | ( 23) | ( 94) | ( 106) | ( 15) | ( 176) | ( 176) | ( 90) | ( 93) | ( 88) |
| BROYDNBD | 10 | 10 | 11 | 17 | 13 | 12 | 11 | 19 | 12 | 12 | 11 | 11 | 12 | 12 | 12 | 11 | 11 | 12 | 12 | 12 | 12 | 12 | 12 |
| BROYDNBD | 50 | 50 | 12 | 12 | 16 | 12 | 9 | 19 | 11 | 9 | 11 | 13 | 13 | 13 | 13 | 12 | 14 | 10 | 14 | 14 | 14 | 14 | 14 |
| BROYDNBD | 100 | 100 | 12 | 12 | 17 | 11 | 10 | 19 | 10 | 11 | 13 | 15 | 13 | 15 | 13 | 12 | 12 | 11 | 12 | 12 | 12 | 12 | 12 |
| BROYDNBD | 500 | 500 | 14 | 14 | 21 | 13 | 10 | 19 | 12 | 10 | 13 | 17 | 10 | 17 | 14 | 12 | 15 | 11 | 13 | 13 | 13 | 13 | 13 |
| BROYDNBD | 1000 | 1000 | 14 | 14 | 29 | 12 | 12 | 19 | 12 | 11 | 13 | 28 | 11 | 28 | 14 | 14 | 14 | 11 | 13 | 13 | 13 | 13 | 13 |
| BROYDNBD | 5000 | 5000 | 26 | 26 | 19 | 15 | 16 | 19 | 9 | 13 | 23 | 35 | 12 | 35 | 16 | —F— | 37 | 11 | 13 | 13 | 13 | 13 | 13 |
| CBRATU2D | 32 | 8 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CBRATU2D | 98 | 50 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CBRATU2D | 512 | 392 | 4 | 5 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU2D | 1058 | 882 | 4 | 6 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| CBRATU3D | 54 | 2 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CBRATU3D | 128 | 16 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CBRATU3D | 686 | 250 | 5 | 5 | 5 | 5 | 5 | 9 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| CBRATU3D | 2000 | 1024 | 4 | 5 | 4 | 4 | 4 | 8 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 7 | 5 | 4 | 4 | 4 | 4 | 4 |
| CHANDHEQ | 10 | 0 | 14 | 14 | 13 | 13 | 13 | 14 | 13 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| CHANDHEQ | 50 | 0 | 14 | 14 | 14 | 14 | 13 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 |
| CHANDHEQ | 100 | 0 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 14 | 14 | 14 | 14 | 15 |
| CHEBYQAD | 2 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 6 |
| CHEBYQAD | 4 | 0 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 8 | 8 | 8 | 8 | 7 | 9 | 7 | 7 | 7 | 7 | 7 | 7 |
| CHEBYQAD | 5 | 0 | 7 | 9 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 |
| CHEBYQAD | 6 | 0 | 12 | 12 | 11 | 8 | 7 | 8 | 10 | 11 | 12 | 11 | 10 | 8 | 12 | 12 | 11 | 10 | 7 | 7 | 11 | 11 | 11 |
| CHEBYQAD | 7 | 0 | 8 | 15 | 12 | 8 | 8 | 8 | 9 | 9 | 9 | 8 | 12 | 10 | 11 | 9 | 9 | 8 | 15 | 15 | 11 | 11 | 11 |
| CHEBYQAD | 8 | 0 | 18 | 18 | 19 | 17 | 10 | 14 | 12 | 12 | 20 | 16 | 14 | 18 | 18 | 19 | 18 | 14 | 45 | 45 | 10 | 10 | 10 |
| CHEBYQAD | 9 | 0 | 16 | 24 | 19 | 11 | 9 | 13 | 9 | 9 | 13 | 8 | 15 | 18 | 12 | 16 | 14 | 12 | 24 | 24 | 17 | 17 | 17 |
| CHEBYQAD | 10 | 0 | 17 | 17 | ( 21) | 15 | ( 11) | ( 16) | ( 11) | ( 12) | 14 | 20 | 14 | 14 | 15 | 17 | 13 | ( 13) | 95 | 95 | 17 | 17 | 17 |
| CHEBYQAD | 20 | 0 | 24 | 24 | 47 | 21 | 17 | 100 | 13 | 21 | 21 | 47 | 25 | 25 | 31 | 20 | 23 | 22 | 70 | 74 | 23 | 23 | 22 |
| CHEBYQAD | 50 | 0 | 46 | 66 | 128 | 890 | 25 | 82 | 24 | 35 | 46 | 120 | 57 | 78 | 124 | 45 | 42 | 27 | —I— | —I— | 40 | 40 | 38 |
| CHEMRCTA | 10 | 10 | 9 | 7 | 7 | 6 | 7 | 73 | 8 | 13 | 6 | 7 | 6 | 6 | 6 | 9 | 9 | 7 | 9 | 10 | 9 | 9 | 9 |
| CHEMRCTA | 50 | 50 | 19 | 9 | 19 | 18 | —F— | —F— | —F— | 239 | 24 | 14 | 34 | 19 | —F— | 19 | 23 | 17 | 25 | 17 | 13 | 19 | 19 |
| CHEMRCTA | 100 | 100 | 49 | 35 | 795 | 30 | —F— | —F— | —F— | —S— | 46 | 23 | —F— | 43 | —F— | 48 | 45 | 46 | 23 | 26 | 22 | 24 | 24 |
| CHEMRCTA | 500 | 500 | —T— | —F— | —F— | —F— | —T— | —F— | —T— | —T— | —T— | 139 | —F— | 109 | —T— | —F— | —F— | —T— | —E— | —T— | —F— | —F— | —T— |
| CHEMRCTA | 1000 | 1000 | —T— | —F— | —F— | —F— | —T— | —T— | —T— | —T— | —T— | 257 | 799 | 228 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTA | 5000 | 5000 | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTB | 10 | 10 | 8 | 8 | 8 | 9 | 10 | —F— | 26 | 22 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 12 | 7 | 12 | 12 | 12 |
| CHEMRCTB | 50 | 50 | 19 | 49 | 22 | —F— | —F— | —F— | —F— | 553 | 19 | 22 | 29 | 22 | 60 | 19 | 15 | 14 | 20 | 18 | 20 | 20 | 20 |

Number of gradient evaluations ( 3 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMRCTB | 100 | 100 | 19 | 28 | 39 | 54 | —F— | —F— | —F— | —S— | 19 | 39 | 39 | 39 | —F— | 19 | 25 | 18 | 26 | 29 | 26 | 26 | 26 |
| CHEMRCTB | 500 | 500 | 65 | 64 | 151 | —F— | —T— | —T— | —T— | —T— | 65 | 151 | 151 | 151 | —F— | 65 | 63 | 63 | 65 | 65 | 65 | 65 | 63 |
| CHEMRCTB | 1000 | 1000 | 105 | —S— | 407 | —F— | —T— | —T— | —T— | —T— | 105 | 282 | 311 | 282 | —F— | 106 | 109 | 103 | —S— | —S— | —S— | —S— | —S— |
| CHNROSNB | 10 | 0 | 27 | 28 | 27 | 25 | 30 | 54 | 28 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 29 | 24 | 30 | 30 | 27 | 27 | 27 |
| CHNROSNB | 25 | 0 | 39 | 37 | 42 | 36 | 46 | 729 | 49 | 39 | 39 | 46 | 44 | 46 | 44 | 39 | 40 | 35 | 51 | 51 | 37 | 37 | 37 |
| CHNROSNB | 50 | 0 | 62 | 62 | 62 | 50 | 64 | 117 | 61 | 62 | 62 | 61 | 63 | 61 | 66 | 62 | 61 | 56 | 82 | 82 | 59 | 59 | 51 |
| CLIFF | 2 | 0 | 28 | 28 | 28 | 28 | 29 | —I— | 29 | 28 | 28 | 30 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 | 28 |
| CLPLATEA | 16 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEA | 49 | 0 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEA | 100 | 0 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CLPLATEA | 529 | 0 | 6 | 12 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| CLPLATEA | 1024 | 0 | 7 | 14 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| CLPLATEA | 5041 | 0 | 7 | 16 | 11 | 6 | 7 | 11 | 7 | 7 | 7 | 11 | 11 | 11 | 12 | 11 | 15 | 6 | 7 | 7 | 7 | 7 | 7 |
| CLPLATEB | 16 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEB | 49 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 100 | 0 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 529 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 1024 | 0 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 5041 | 0 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEC | 16 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEC | 49 | 0 | 4 | 5 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEC | 100 | 0 | 4 | 5 | 2 | 2 | 3 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLPLATEC | 529 | 0 | 5 | 5 | 2 | 2 | 3 | 6 | 4 | 5 | 5 | 2 | 2 | 2 | 3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CLPLATEC | 1024 | 0 | 5 | 5 | 2 | 2 | 3 | 7 | 5 | 5 | 5 | 2 | 2 | 2 | 4 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CLPLATEC | 5041 | 0 | 4 | 5 | 2 | 2 | 3 | 14 | 5 | 4 | 4 | 2 | 2 | 2 | 4 | 4 | 8 | 4 | 4 | 4 | 4 | 4 | 4 |
| CLUSTER | 2 | 2 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | 11 | 11 | 10 | 11 | 11 | 6 | 11 | 11 | 10 | 10 | 16 | 12 | 12 | 12 |
| CORKSCRW | 96 | 70 | 36 | 40 | 242 | 52 | 31 | 54 | 40 | 43 | 42 | 35 | 51 | 35 | 59 | 40 | 37 | 36 | 46 | 362 | 41 | 60 | 67 |
| CORKSCRW | 456 | 350 | 129 | 151 | —I— | 99 | —T— | 636 | 143 | 149 | 119 | 101 | 82 | 72 | 94 | 129 | 127 | 91 | 269 | —I— | 143 | 184 | 168 |
| CORKSCRW | 906 | 700 | —T— | 318 | —I— | —I— | —T— | —I— | —T— | —T— | —S— | 120 | —S— | 107 | 119 | —T— | —T— | —T— | —T— | —I— | —T— | —T— | —T— |
| CORKSCRW | 4506 | 3500 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CORKSCRW | 9006 | 7000 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CRAGGLVY | 4 | 0 | 16 | 20 | 16 | 16 | 17 | 34 | 17 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 |
| CRAGGLVY | 10 | 0 | 15 | 16 | 15 | 15 | 15 | 56 | 17 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 14 | 15 | 15 | 14 | 15 | 15 | 15 |
| CRAGGLVY | 50 | 0 | 15 | 15 | 15 | 15 | 14 | 56 | 17 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| CRAGGLVY | 100 | 0 | 15 | 15 | 15 | 15 | 14 | 56 | 17 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| CRAGGLVY | 500 | 0 | 15 | 16 | 15 | 15 | 14 | 56 | 17 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 |
| CRAGGLVY | 1000 | 0 | 15 | 16 | 15 | 15 | 14 | 44 | 17 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 16 |
| CRAGGLVY | 5000 | 0 | 15 | 16 | 15 | 15 | 14 | 40 | 16 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 17 | 15 | 15 | 15 | 15 | 15 | —S— |
| CUBE | 2 | 0 | 33 | 58 | 29 | 29 | 37 | 488 | 39 | 33 | 33 | 39 | 41 | 40 | 39 | 33 | 40 | 41 | 34 | 26 | 30 | 30 | 30 |
| DALLASL | 906 | 667 | 92 | —T— | 431 | 46 | 120 | —I— | 111 | 111 | 81 | 67 | 48 | 48 | 84 | 85 | 97 | 66 | 94 | —I— | 94 | 113 | ( 131) |
| DALLASM | 196 | 151 | 83 | —I— | 44 | 49 | 337 | —I— | 377 | 191 | 74 | 62 | 43 | 43 | 78 | 83 | 86 | 67 | 89 | —I— | 88 | 88 | 86 |
| DALLASS | 46 | 31 | 80 | —S— | 40 | 40 | 98 | —I— | 108 | 124 | 94 | 64 | 39 | 39 | 63 | 87 | 88 | 59 | 88 | —I— | 88 | 91 | 115 |
| DEGENLPA | 20 | 15 | 26 | 21 | —I— | 26 | 122 | —I— | 40 | 47 | 19 | 35 | 24 | 21 | 50 | —S— | 27 | —S— | 33 | —S— | 33 | 33 | 33 |
| DEGENLPB | 20 | 15 | —S— | —S— | —I— | 21 | 144 | —I— | —S— | 39 | —S— | 27 | —S— | 18 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| DENSCHNA | 2 | 0 | 6 | 6 | 6 | 6 | 6 | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| DENSCHNB | 2 | 0 | 4 | 4 | 4 | 4 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 3 | 3 | 3 | 3 | 3 |
| DENSCHNC | 2 | 0 | 10 | 12 | 10 | 10 | 10 | 51 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 10 | 10 | 10 |
| DENSCHND | 3 | 0 | 33 | 38 | 45 | 64 | 29 | —I— | 32 | 32 | 33 | 31 | 39 | 35 | 49 | 33 | 32 | 31 | 41 | —I— | 34 | 34 | 34 |
| DENSCHNE | 3 | 0 | 11 | —E— | 11 | 12 | 16 | 16 | 11 | 11 | 11 | 11 | 10 | 11 | 13 | 12 | 14 | 11 | 11 | 10 | 11 | 11 | 11 |
| DENSCHNF | 2 | 0 | 7 | 7 | 7 | 7 | 7 | 33 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| DIPIGRI | 7 | 4 | 52 | 52 | 33 | 21 | 27 | 501 | 38 | 50 | 35 | 39 | 30 | 29 | 45 | 51 | 281 | 33 | 45 | —I— | 41 | 60 | —I— |
| DISC2 | 29 | 23 | 63 | 56 | —I— | 133 | 67 | 258 | 58 | 91 | 142 | 77 | 71 | 69 | 129 | 71 | 66 | 71 | 93 | —I— | 68 | 67 | 74 |
| DISCS | 36 | 66 | 616 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —F— | ( 208) | —I— | ( 315) | —F— | —I— | —T— | 352 | 241 | 611 | 615 | —I— |
| DIXCHLNG | 10 | 5 | 33 | 40 | 35 | 22 | 27 | 571 | 31 | ( 60) | 28 | 32 | 32 | 26 | 26 | 37 | 31 | 32 | 64 | —I— | 27 | 31 | ( 274) |
| DIXCHLNV | 10 | 5 | 15 | 52 | 12 | 12 | 19 | 564 | 19 | 14 | 12 | 15 | 12 | 15 | 36 | 44 | 22 | 15 | 25 | —I— | 49 | 27 | 27 |
| DIXMAANA | 15 | 0 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 7 | 13 | 3 | 7 | 7 | 17 |
| DIXMAANA | 90 | 0 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 7 | 7 | 12 | 3 | 13 | 8 | 3 |
| DIXMAANA | 300 | 0 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 8 | 7 | 12 | 3 | 12 | 8 | 3 |
| DIXMAANA | 1500 | 0 | 6 | 6 | 6 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 9 | 6 | 13 | 3 | 12 | 8 | 3 |

Number of gradient evaluations ( 4 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXMAANA | 3000 | 0 | 6 | 6 | 6 | 6 | 5 | 7 | 6 | 6 | 6 | 6 | 5 | 6 | 6 | 6 | 9 | 6 | 13 | 3 | 12 | 8 | 3 |
| DIXMAANB | 15 | 0 | 7 | 7 | 7 | 6 | 7 | 10 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 7 | 9 | 8 | 10 | 3 | 20 | 9 | 20 |
| DIXMAANB | 90 | 0 | 9 | 9 | 9 | 7 | 7 | 10 | 7 | 9 | 9 | 7 | 7 | 8 | 7 | 9 | 9 | 9 | 10 | 3 | 16 | 9 | 16 |
| DIXMAANB | 300 | 0 | 8 | 8 | 7 | 7 | 7 | 10 | 7 | 8 | 8 | 12 | 7 | 10 | 7 | 8 | 10 | 9 | 10 | 3 | 17 | 9 | 16 |
| DIXMAANB | 1500 | 0 | 8 | 8 | 8 | 7 | 7 | 10 | 7 | 8 | 8 | 8 | 7 | 12 | 7 | 8 | 11 | 9 | 10 | 3 | 16 | 9 | 16 |
| DIXMAANB | 3000 | 0 | 8 | 8 | 7 | 7 | 7 | 10 | 7 | 8 | 8 | 8 | 7 | 10 | 7 | 8 | 14 | 9 | 10 | 3 | 16 | 9 | 16 |
| DIXMAANC | 15 | 0 | 9 | 9 | 8 | 7 | 8 | 12 | 9 | 10 | 9 | 8 | 8 | 9 | 11 | 9 | 10 | 8 | 15 | 3 | 27 | 10 | 19 |
| DIXMAANC | 90 | 0 | 9 | 9 | 10 | 10 | 8 | 12 | 8 | 9 | 9 | 8 | 8 | 8 | 8 | 9 | 13 | 11 | 14 | 3 | 27 | 10 | 12 |
| DIXMAANC | 300 | 0 | 11 | 11 | 10 | 10 | 8 | 12 | 8 | 11 | 11 | 8 | 9 | 10 | 10 | 11 | 14 | 10 | 13 | 3 | 28 | 10 | 12 |
| DIXMAANC | 1500 | 0 | 16 | 16 | 12 | 10 | 8 | 12 | 8 | 16 | 16 | 15 | 9 | 15 | 11 | 13 | 13 | 11 | 13 | 3 | 24 | 10 | 12 |
| DIXMAANC | 3000 | 0 | 14 | 14 | 18 | 10 | 8 | 12 | 8 | 14 | 14 | 14 | 9 | 11 | 11 | 13 | 14 | 11 | 13 | 3 | 27 | 10 | 12 |
| DIXMAAND | 15 | 0 | 9 | 14 | 9 | 11 | 9 | 14 | 9 | 11 | 9 | 11 | 9 | 10 | 12 | 9 | 10 | 11 | 15 | 3 | 42 | 11 | 22 |
| DIXMAAND | 90 | 0 | 10 | 18 | 9 | 11 | 9 | 14 | 9 | 10 | 10 | 11 | 13 | 9 | 11 | 11 | 14 | 12 | 19 | 3 | 32 | 11 | 22 |
| DIXMAAND | 300 | 0 | 10 | 21 | 9 | 11 | 9 | 14 | 9 | 10 | 10 | 13 | 12 | 12 | 19 | 10 | 14 | 12 | 21 | 3 | 32 | 11 | 22 |
| DIXMAAND | 1500 | 0 | 9 | 20 | 12 | 11 | 9 | 14 | 9 | 9 | 9 | 14 | 12 | 13 | 12 | 9 | 15 | 12 | 27 | 3 | 36 | 11 | 22 |
| DIXMAAND | 3000 | 0 | 10 | 12 | 12 | 11 | 9 | 14 | 9 | 10 | 10 | 10 | 14 | 14 | 20 | 11 | 15 | 11 | 30 | 3 | 35 | 11 | 22 |
| DIXMAANE | 15 | 0 | 7 | 8 | 7 | 7 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 7 | 8 | 10 | 3 | 17 | 9 | 19 |
| DIXMAANE | 90 | 0 | 7 | 13 | 11 | 8 | 8 | 10 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 7 | 11 | 9 | 12 | 3 | 51 | 10 | 28 |
| DIXMAANE | 300 | 0 | 7 | 12 | 8 | 8 | 8 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 9 | 9 | 53 | 3 | 63 | 13 | 74 |
| DIXMAANE | 1500 | 0 | 7 | 12 | 9 | 8 | 8 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 13 | 9 | 37 | 3 | 75 | 16 | 186 |
| DIXMAANE | 3000 | 0 | 7 | 13 | 10 | 8 | 8 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 16 | 9 | 53 | 3 | 71 | 15 | 259 |
| DIXMAANF | 15 | 0 | 10 | 7 | 10 | 11 | 10 | 10 | 9 | 10 | 10 | 12 | 10 | 9 | 9 | 10 | 9 | 10 | 12 | 3 | 41 | 11 | 21 |
| DIXMAANF | 90 | 0 | 10 | 24 | 12 | 14 | 13 | 11 | 11 | 10 | 10 | 13 | 11 | 12 | 12 | 10 | 22 | 12 | 20 | 3 | 200 | 14 | 25 |
| DIXMAANF | 300 | 0 | 17 | 14 | 19 | 13 | 14 | 13 | 11 | 17 | 17 | 15 | 18 | 13 | 16 | 11 | 16 | 13 | 21 | 3 | 341 | 14 | 76 |
| DIXMAANF | 1500 | 0 | 21 | 19 | 20 | 17 | 15 | 16 | 15 | 21 | 21 | 22 | 21 | 17 | 32 | 32 | 42 | 17 | 30 | 3 | 417 | 22 | 266 |
| DIXMAANF | 3000 | 0 | 23 | 77 | 17 | 16 | 15 | 16 | 18 | 23 | 23 | 27 | 22 | 30 | 11 | 36 | 23 | 18 | 32 | 3 | 40 | 16 | 463 |
| DIXMAANG | 15 | 0 | 10 | 14 | 10 | 12 | 11 | 12 | 9 | 9 | 10 | 10 | 12 | 10 | 12 | 10 | 12 | 12 | 21 | 3 | 48 | 12 | 25 |
| DIXMAANG | 90 | 0 | 15 | 25 | 14 | 15 | 15 | 13 | 12 | 15 | 15 | 13 | 12 | 12 | 15 | 11 | 11 | 13 | 26 | 3 | 107 | 15 | 45 |
| DIXMAANG | 300 | 0 | 21 | 36 | 29 | 14 | 12 | 14 | 13 | 21 | 21 | 15 | 25 | 16 | 37 | 15 | 31 | 14 | 22 | 3 | 328 | 22 | 139 |
| DIXMAANG | 1500 | 0 | 19 | 92 | 30 | 21 | 14 | 16 | 14 | 19 | 19 | 32 | 27 | 26 | 35 | 23 | 24 | 19 | 32 | 3 | 444 | 22 | 529 |
| DIXMAANG | 3000 | 0 | 41 | 162 | 26 | 17 | 18 | 16 | 15 | 41 | 41 | 32 | 24 | 36 | 23 | 44 | 26 | 19 | 31 | 3 | —I— | 32 | 925 |
| DIXMAANH | 15 | 0 | 12 | 19 | 13 | 11 | 12 | 15 | 10 | 10 | 12 | 11 | 11 | 12 | 12 | 11 | 12 | 11 | 15 | 3 | 64 | 16 | 28 |
| DIXMAANH | 90 | 0 | 18 | 25 | 17 | 14 | 14 | 16 | 13 | 18 | 18 | 14 | 15 | 16 | 27 | 11 | 21 | 14 | 30 | 3 | 141 | 14 | 89 |
| DIXMAANH | 300 | 0 | 20 | 28 | 19 | 18 | 17 | 17 | 13 | 20 | 20 | 23 | 22 | 25 | 28 | 25 | 19 | 18 | 35 | 3 | —I— | 17 | 239 |
| DIXMAANH | 1500 | 0 | 31 | 88 | 28 | 20 | 16 | 19 | 16 | 31 | 31 | 31 | 26 | 21 | 29 | 24 | 22 | 19 | 34 | 3 | —I— | 23 | 870 |
| DIXMAANH | 3000 | 0 | 34 | 153 | 46 | —T— | 18 | 21 | 15 | 34 | 34 | 34 | 39 | 32 | 42 | 26 | 56 | 18 | 131 | 3 | —I— | 35 | —I— |
| DIXMAANI | 15 | 0 | 6 | 17 | 8 | 9 | 8 | 12 | 7 | 7 | 6 | 7 | 6 | 6 | 7 | 6 | 7 | 8 | 12 | 3 | 53 | 13 | 21 |
| DIXMAANI | 90 | 0 | 7 | 12 | 10 | 8 | 8 | 11 | 7 | 7 | 7 | 7 | 6 | 6 | 7 | 7 | 10 | 9 | 14 | 3 | 86 | 10 | —I— |
| DIXMAANI | 300 | 0 | 7 | 15 | 14 | 8 | 8 | 12 | 7 | 7 | 7 | 7 | 6 | 7 | 7 | 7 | 15 | 9 | 22 | 3 | 106 | 12 | —I— |
| DIXMAANI | 1500 | 0 | 8 | 16 | 15 | 8 | 8 | 13 | 7 | 8 | 8 | 7 | 6 | 8 | 7 | 8 | 18 | 8 | 39 | 3 | 161 | 12 | 4 |
| DIXMAANI | 3000 | 0 | 8 | 16 | 21 | 8 | 8 | 13 | 7 | 8 | 8 | 7 | 7 | 8 | 7 | 8 | 11 | 8 | 114 | 3 | 172 | 15 | 3 |
| DIXMAANJ | 15 | 0 | 11 | 1 | 10 | 14 | 12 | 12 | 9 | 13 | 11 | 13 | 13 | 12 | 7 | 11 | 12 | 13 | 18 | 3 | 333 | 14 | 27 |
| DIXMAANJ | 90 | 0 | 18 | 1 | 21 | 13 | 16 | 14 | 11 | 18 | 18 | 14 | 16 | 23 | 22 | 18 | 31 | 14 | 31 | 3 | 283 | 18 | 691 |
| DIXMAANJ | 300 | 0 | 20 | 1 | 27 | 13 | 19 | 16 | 14 | 20 | 20 | 32 | 29 | 22 | 33 | 25 | 18 | 15 | 33 | 3 | 122 | 32 | —I— |
| DIXMAANJ | 1500 | 0 | 28 | 1 | 284 | 19 | 25 | 19 | 23 | 26 | 28 | 50 | 33 | 40 | 25 | 27 | 24 | 18 | 26 | 3 | 124 | 36 | 3 |
| DIXMAANJ | 3000 | 0 | 34 | 1 | 657 | —T— | 37 | 18 | 14 | 32 | 33 | 65 | 42 | 41 | 24 | 27 | 42 | 19 | 28 | 3 | 49 | 34 | 3 |
| DIXMAANK | 15 | 0 | 14 | 19 | 15 | 12 | 12 | 14 | 10 | 9 | 14 | 16 | 11 | 15 | 10 | 14 | 16 | 14 | 45 | 3 | 139 | 14 | 41 |
| DIXMAANK | 90 | 0 | 17 | 150 | 49 | 13 | 16 | 18 | 14 | 17 | 17 | 20 | 16 | 17 | 22 | 22 | 21 | 18 | 37 | 3 | 196 | 22 | —I— |
| DIXMAANK | 300 | 0 | 22 | 89 | 36 | 19 | 21 | 19 | 13 | 22 | 22 | 32 | 36 | 26 | 29 | 29 | 25 | 17 | 30 | 3 | 192 | 25 | —I— |
| DIXMAANK | 1500 | 0 | 30 | 228 | 69 | 19 | 31 | 19 | 19 | 33 | 30 | 44 | 44 | 59 | 28 | 27 | 35 | 20 | 32 | 3 | 101 | 35 | 3 |
| DIXMAANK | 3000 | 0 | 29 | 199 | 149 | —T— | 33 | 19 | 18 | 29 | 29 | 48 | 25 | 51 | 22 | 34 | 73 | 19 | 29 | 3 | 82 | 36 | 3 |
| DIXMAANL | 15 | 0 | 13 | 20 | 15 | 14 | 12 | 16 | 10 | 10 | 13 | 13 | 13 | 14 | 14 | 13 | 12 | 13 | 21 | 3 | 126 | 16 | 42 |
| DIXMAANL | 90 | 0 | 35 | 55 | 35 | 16 | 19 | 19 | 12 | 35 | 35 | 26 | 28 | 26 | 16 | 16 | 35 | 15 | 84 | —I— | 348 | 18 | —I— |
| DIXMAANL | 300 | 0 | 23 | 91 | 67 | 17 | 26 | 24 | 15 | 23 | 23 | 37 | 40 | 42 | 26 | 37 | 36 | 16 | 34 | —E— | 608 | 30 | —I— |
| DIXMAANL | 1500 | 0 | 35 | 196 | 146 | 16 | 30 | 22 | 16 | 32 | 35 | 61 | 30 | 55 | 35 | 45 | 46 | 17 | 30 | —T— | 106 | 42 | 3 |
| DIXMAANL | 3000 | 0 | 39 | 134 | 209 | —T— | 31 | 23 | 16 | 43 | 39 | 59 | 67 | 58 | 24 | 47 | 38 | 30 | 37 | —T— | 81 | 41 | 3 |
| DIXON3DQ | 10 | 0 | 3 | 3 | 3 | 3 | 4 | 7 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| DIXON3DQ | 50 | 0 | 3 | 3 | 3 | 3 | 5 | 10 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| DIXON3DQ | 100 | 0 | 3 | 3 | 3 | 3 | 5 | 10 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |

Number of gradient evaluations ( 5 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXON3DQ | 500 | 0 | 3 | 3 | 3 | 3 | 6 | 12 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| DIXON3DQ | 1000 | 0 | 3 | 3 | 3 | 3 | 6 | 13 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| DIXON3DQ | 5000 | 0 | 3 | 3 | 3 | 3 | 6 | 15 | 6 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 9 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 10 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 50 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 100 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 500 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 1000 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQDRTIC | 5000 | 0 | 3 | 4 | 3 | 3 | 3 | 26 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 9 | 3 | 3 | 3 | 3 | 3 | 3 |
| DQRTIC | 10 | 0 | 18 | 19 | 18 | 18 | 18 | 122 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| DQRTIC | 50 | 0 | 25 | 30 | 24 | 24 | 25 | —I— | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | 25 | 25 | 25 | 25 | 25 | 25 |
| DQRTIC | 100 | 0 | 27 | 35 | 27 | 27 | 27 | —I— | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 29 | 27 | 27 | 27 | 27 | 27 | 27 |
| DQRTIC | 500 | 0 | 34 | 42 | 33 | 33 | 34 | —I— | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 37 | 34 | 34 | 34 | 34 | 34 | 34 |
| DQRTIC | 1000 | 0 | 36 | 46 | 36 | 36 | 36 | —I— | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 40 | 36 | 36 | 36 | 36 | 36 | 36 |
| DQRTIC | 5000 | 0 | 43 | 55 | 42 | 42 | 43 | —I— | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 48 | 43 | 43 | 43 | 43 | 43 | 43 |
| EDENSCH | 36 | 0 | 13 | 12 | 14 | 13 | 13 | 89 | 14 | 13 | 13 | 14 | 14 | 14 | 13 | 13 | 17 | 13 | 30 | —I— | 15 | 13 | 13 |
| EDENSCH | 2000 | 0 | 13 | 12 | 15 | 13 | 15 | 89 | 13 | 13 | 13 | 15 | 15 | 15 | 14 | 13 | 21 | 13 | 46 | —I— | 15 | 13 | 13 |
| ENGVAL1 | 2 | 0 | 8 | 8 | 8 | 8 | 8 | 13 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 14 | 8 | 8 | 8 |
| ENGVAL1 | 50 | 0 | 8 | 8 | 8 | 8 | 8 | 15 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 8 | 8 | 18 | 8 | 8 | 8 |
| ENGVAL1 | 100 | 0 | 8 | 8 | 8 | 8 | 8 | 15 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 11 | 8 | 8 | 18 | 8 | 8 | 8 |
| ENGVAL1 | 1000 | 0 | 8 | 13 | 8 | 8 | 8 | 15 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 12 | 8 | 8 | 19 | 8 | 8 | 8 |
| ENGVAL1 | 5000 | 0 | 8 | 13 | 8 | 8 | 8 | 15 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 13 | 8 | 8 | —S— | 8 | 8 | 8 |
| ENGVAL2 | 3 | 0 | 17 | 17 | 19 | 17 | 17 | 63 | 20 | 19 | 17 | 20 | 18 | 17 | 18 | 19 | 19 | 20 | 18 | 18 | 18 | 19 | 19 |
| ERRINBAR | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| ERRINROS | 10 | 0 | 47 | —S— | 43 | 41 | 64 | ( 46) | 67 | 47 | 47 | 41 | 42 | 41 | 44 | 47 | 47 | 59 | 90 | 90 | 40 | 40 | 44 |
| ERRINROS | 25 | 0 | 48 | 66 | 56 | 45 | 65 | ( 44) | 92 | 48 | 48 | 52 | 46 | 52 | 53 | 52 | 50 | 62 | 84 | 84 | 43 | 43 | 73 |
| ERRINROS | 50 | 0 | 64 | 57 | 59 | 42 | 66 | ( 83) | 80 | 64 | 64 | 54 | 57 | 54 | 43 | 62 | 64 | 60 | 79 | 79 | 42 | 42 | 112 |
| EXPFIT | 2 | 0 | 12 | 12 | —E— | —E— | 12 | —E— | 12 | 12 | 12 | 13 | 12 | 13 | 12 | 10 | 12 | 12 | 12 | —I— | 10 | 12 | 12 |
| EXPFITA | 5 | 22 | 18 | 31 | —I— | 16 | 33 | 440 | 23 | 29 | 21 | 19 | 15 | 17 | 17 | 18 | 22 | 18 | 45 | —I— | 73 | 74 | 66 |
| EXPFITB | 5 | 102 | 64 | 53 | —I— | 28 | 53 | 917 | 58 | 64 | 67 | 24 | 30 | 30 | 31 | 63 | 346 | 62 | 117 | —I— | 205 | 89 | 150 |
| EXPFITC | 5 | 502 | 89 | —S— | —T— | 45 | 88 | —I— | 90 | 90 | 84 | 55 | 44 | 46 | 56 | 88 | 600 | 82 | 150 | —I— | 264 | 114 | —I— |
| EXTROSNB | 5 | 0 | 55 | 56 | 58 | 55 | 67 | 198 | 82 | 55 | 55 | 55 | 55 | 55 | 55 | 55 | 60 | 56 | 58 | 58 | 56 | 56 | 56 |
| EXTROSNB | 10 | 0 | 441 | 418 | 432 | 374 | 321 | —I— | 563 | 441 | 441 | 430 | 430 | 430 | 430 | 441 | 417 | 370 | 496 | 496 | 425 | 425 | 425 |
| FREUROTH | 2 | 0 | 10 | 7 | 10 | 10 | 10 | 49 | 12 | 10 | 10 | 12 | 10 | 10 | 10 | 10 | 10 | 11 | 16 | 29 | 9 | 9 | 9 |
| FREUROTH | 10 | 0 | 11 | 6 | 11 | 11 | 10 | 50 | 14 | 11 | 11 | 11 | 9 | 11 | 11 | 13 | 11 | 12 | 21 | 31 | 13 | 13 | 13 |
| FREUROTH | 50 | 0 | 10 | 6 | 11 | 11 | 10 | 50 | 14 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 20 | 29 | 10 | 10 | —I— |
| FREUROTH | 100 | 0 | 10 | 6 | 11 | 11 | 10 | 50 | 14 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 20 | 33 | 10 | 10 | —I— |
| FREUROTH | 500 | 0 | 10 | 6 | 11 | 11 | 10 | 50 | —S— | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | 11 | —S— | —S— | 10 | 10 | 21 |
| FREUROTH | 1000 | 0 | 10 | 6 | 11 | 11 | —S— | 50 | —S— | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 12 | 11 | 27 | —S— | 10 | 10 | —S— |
| FREUROTH | 5000 | 0 | 10 | 6 | 11 | 11 | 10 | 50 | —S— | 10 | 10 | 10 | 10 | 10 | 10 | 12 | —S— | 11 | —S— | —S— | 10 | 10 | —S— |
| GAUSSELM | 14 | 11 | 29 | —E— | 56 | ( 11) | ( 7) | ( 9) | ( 28) | ( 19) | ( 27) | 34 | 24 | ( 18) | 34 | 33 | 36 | 24 | 82 | —I— | 27 | 25 | 25 |
| GAUSSELM | 506 | 1135 | —T— | —E— | —I— | ( 631) | ( 10) | —I— | 236 | ( 342) | —T— | —I— | ( 378) | ( 290) | ( 246) | ( 350) | ( 281) | —T— | —I— | —I— | ( 270) | ( 192) | ( 641) |
| GAUSSELM | 650 | 1496 | —T— | —E— | —I— | ( 203) | ( 9) | —I— | —T— | 185 | ( 167) | —I— | ( 327) | ( 493) | ( 296) | ( 237) | —T— | —T— | —I— | —I— | —T— | —T— | ( 509) |
| GOTTFR | 2 | 0 | 26 | 26 | 13 | 17 | 14 | 366 | 13 | 26 | 26 | 26 | 14 | 14 | 13 | 26 | 24 | 16 | 11 | 9 | 14 | 13 | 13 |
| GRIDNETA | 60 | 36 | 24 | 27 | 10 | 9 | 17 | 54 | 24 | 25 | 9 | 9 | 9 | 9 | 19 | 23 | 25 | 22 | 24 | 388 | 23 | 24 | 24 |
| GRIDNETA | 180 | 100 | 26 | 38 | 14 | 14 | 20 | 85 | 26 | 26 | 27 | 14 | 14 | 14 | 28 | 26 | 28 | 26 | 26 | 216 | 26 | 26 | 26 |
| GRIDNETA | 612 | 324 | 29 | 41 | 13 | 14 | 21 | 97 | 30 | 29 | 29 | 13 | 13 | 13 | 27 | 27 | 32 | 29 | 29 | 309 | 29 | 29 | 29 |
| GRIDNETA | 924 | 484 | 37 | 51 | 23 | 23 | 28 | 180 | 37 | 38 | 37 | 23 | 23 | 23 | 37 | 38 | 42 | 38 | 38 | 241 | 38 | 38 | 38 |
| GRIDNETA | 3444 | 1764 | 36 | 53 | —I— | 18 | 29 | 149 | 39 | 39 | 36 | 19 | 19 | 19 | 34 | 34 | 41 | 32 | 36 | 372 | 36 | 36 | 37 |
| GRIDNETA | 7564 | 3844 | 57 | —T— | —I— | 31 | —T— | —T— | —T— | —T— | —T— | 32 | 32 | 32 | —T— | 58 | —T— | —T— | 59 | —T— | —T— | 59 | —T— |
| GRIDNETA | 13284 | 6724 | —T— | —T— | —I— | 62 | —T— | —T— | —T— | —T— | —T— | 63 | 63 | 63 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETB | 60 | 36 | 20 | 20 | 8 | 8 | 15 | 42 | 19 | 22 | 21 | 8 | 8 | 8 | 18 | 21 | 22 | 21 | 21 | —I— | 20 | 21 | 20 |
| GRIDNETB | 180 | 100 | 22 | 22 | 9 | 9 | 15 | 59 | 22 | 22 | 22 | 9 | 9 | 9 | 22 | 22 | 25 | 23 | 22 | —I— | 22 | 22 | 22 |
| GRIDNETB | 612 | 324 | 23 | 23 | 9 | 9 | 15 | 85 | 23 | 24 | 23 | 9 | 9 | 9 | 23 | 23 | 26 | 23 | 23 | —I— | 22 | 23 | 27 |
| GRIDNETB | 924 | 484 | 27 | 27 | 10 | 10 | 17 | 94 | 26 | 27 | 27 | 10 | 10 | 10 | 26 | 26 | 30 | 26 | 26 | —I— | 26 | 26 | 26 |
| GRIDNETB | 3444 | 1764 | 27 | 27 | 10 | 10 | 17 | 117 | 27 | 30 | 27 | 10 | 10 | 10 | 29 | 27 | 33 | 27 | 27 | —I— | 27 | 27 | 27 |
| GRIDNETB | 7564 | 3844 | 28 | 28 | 10 | 10 | 17 | 124 | 28 | 30 | 28 | 10 | 10 | 10 | 28 | 28 | 34 | 28 | 28 | —I— | 28 | 28 | 28 |
| GRIDNETB | 13284 | 6724 | 28 | 28 | 10 | 10 | 17 | 128 | 28 | 30 | —T— | 10 | 10 | 10 | 28 | 28 | 36 | 28 | 28 | —I— | 28 | 28 | 28 |
| GRIDNETC | 60 | 36 | 21 | 33 | 351 | 9 | 16 | 42 | 22 | 23 | 22 | 9 | 9 | 9 | 16 | 20 | 25 | 21 | 21 | —I— | 21 | 21 | 21 |

Number of gradient evaluations ( 6 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRIDNETC | 180 | 100 | 24 | 33 | 370 | 8 | 16 | 59 | 22 | 23 | 23 | 8 | 8 | 8 | 23 | 23 | 26 | 24 | 22 | —I— | 23 | 23 | 23 |
| GRIDNETC | 612 | 324 | 24 | 35 | —I— | 11 | 18 | 84 | 26 | 25 | 24 | 12 | 12 | 12 | 24 | 23 | 26 | 24 | 26 | —I— | 25 | 26 | 25 |
| GRIDNETC | 924 | 484 | 29 | 36 | —I— | 12 | 20 | 93 | 27 | 28 | 29 | 13 | 13 | 13 | 27 | 29 | 30 | 30 | 27 | —I— | 30 | 27 | 30 |
| GRIDNETC | 3444 | 1764 | 32 | 45 | —I— | 16 | 21 | 106 | 30 | 33 | 32 | 16 | 16 | 16 | 29 | 33 | 34 | 33 | 35 | —I— | 34 | 35 | 32 |
| GRIDNETC | 7564 | 3844 | —T— | —T— | —I— | 29 | —T— | —T— | —T— | —T— | —T— | 28 | 28 | 28 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETD | 60 | 36 | 23 | 32 | 10 | 9 | 17 | 55 | 24 | 24 | 9 | 10 | 9 | 9 | 20 | 24 | 25 | 24 | 24 | 313 | 23 | 24 | 70 |
| GRIDNETD | 180 | 100 | 25 | 32 | 12 | 12 | 18 | 85 | 23 | 24 | 24 | 14 | 12 | 12 | 25 | 25 | 27 | 23 | 26 | 154 | 26 | 25 | 71 |
| GRIDNETD | 612 | 324 | 28 | 33 | 13 | 13 | 21 | 98 | 29 | 28 | 28 | 14 | 13 | 13 | 29 | 28 | 32 | 30 | 28 | 205 | 28 | 41 | 79 |
| GRIDNETD | 924 | 484 | 36 | 46 | 37 | 21 | 26 | 179 | 36 | 34 | 36 | 22 | 21 | 21 | 36 | 36 | 40 | 35 | 35 | 172 | 35 | 44 | 96 |
| GRIDNETD | 3444 | 1764 | 42 | 56 | —I— | 17 | 30 | 146 | 44 | 40 | 42 | 20 | 18 | 18 | 36 | 39 | 44 | —S— | 41 | 264 | 39 | 58 | 103 |
| GRIDNETD | 7564 | 3844 | —T— | —T— | —T— | 34 | —T— | —T— | —T— | —T— | —T— | 36 | 34 | 34 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETE | 60 | 36 | 21 | 21 | 8 | 8 | 15 | 42 | 19 | 21 | 21 | 8 | 8 | 8 | 18 | 21 | 22 | 20 | 21 | —I— | 20 | 23 | 258 |
| GRIDNETE | 180 | 100 | 22 | 22 | 9 | 9 | 15 | 59 | 22 | 22 | 22 | 9 | 9 | 9 | 23 | 22 | 24 | 23 | 22 | —I— | 22 | 26 | —I— |
| GRIDNETE | 612 | 324 | 23 | 23 | 9 | 9 | 15 | 84 | 23 | 24 | 23 | 9 | 9 | 9 | 23 | 23 | 26 | 23 | 24 | —I— | 23 | 38 | —I— |
| GRIDNETE | 924 | 484 | 26 | 26 | 10 | 10 | 17 | 94 | 26 | 27 | 26 | 10 | 10 | 10 | 27 | 26 | 29 | 26 | 26 | —I— | 26 | 37 | —I— |
| GRIDNETE | 3444 | 1764 | 27 | 27 | 12 | 12 | 17 | 114 | 27 | 30 | 27 | 12 | 12 | 12 | 29 | 27 | 34 | 27 | 27 | —I— | 28 | 51 | —I— |
| GRIDNETE | 7564 | 3844 | 28 | 28 | 12 | 12 | 17 | 121 | 28 | 30 | 28 | 12 | 12 | 12 | 28 | 28 | 34 | 28 | 28 | —I— | 28 | 51 | —I— |
| GRIDNETF | 60 | 36 | 20 | 34 | 81 | 8 | 15 | 41 | 22 | 22 | 21 | 9 | 8 | 8 | 17 | 21 | 24 | 21 | 21 | —I— | 19 | 21 | 121 |
| GRIDNETF | 180 | 100 | 23 | 33 | 546 | 10 | 16 | 62 | 22 | 23 | 22 | 11 | 10 | 10 | 24 | 23 | 25 | 23 | 24 | —I— | 23 | 33 | 448 |
| GRIDNETF | 612 | 324 | 24 | 36 | —I— | 10 | 16 | 82 | 24 | 25 | 24 | 12 | 10 | 10 | 24 | 24 | 26 | 25 | 23 | —I— | 25 | 41 | 202 |
| GRIDNETF | 924 | 484 | 26 | 39 | —I— | 13 | 19 | 90 | 27 | 27 | 26 | 13 | 11 | 11 | 28 | 27 | 31 | 28 | 29 | —I— | 30 | 45 | —I— |
| GRIDNETF | 3444 | 1764 | 31 | 41 | —I— | 14 | 21 | 104 | 30 | 33 | 31 | 15 | 14 | 14 | 29 | 33 | 38 | 33 | 36 | —I— | 34 | 63 | —I— |
| GRIDNETF | 7564 | 3844 | —T— | —T— | —T— | 27 | —T— | —T— | —T— | —T— | —T— | 30 | 29 | 29 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETG | 60 | 36 | 23 | 24 | 9 | 8 | 17 | 59 | 24 | 24 | 9 | 9 | 8 | 8 | 18 | 22 | 24 | 23 | 22 | 282 | 24 | 22 | 22 |
| GRIDNETH | 60 | 36 | 21 | 21 | 8 | 8 | 15 | 42 | 19 | 22 | 23 | 9 | 8 | 8 | 13 | 21 | 23 | 22 | 20 | —I— | 19 | 19 | 19 |
| GRIDNETI | 60 | 36 | 20 | 20 | 77 | 8 | 15 | 42 | 19 | 22 | 21 | 9 | 8 | 8 | 12 | 21 | 24 | 21 | 20 | 722 | 19 | 20 | 20 |
| GULF | 3 | 0 | 32 | 36 | 38 | 33 | 36 | —E— | 38 | 48 | 32 | 40 | 40 | 36 | 36 | 32 | 37 | 32 | 141 | —I— | 38 | 36 | 38 |
| HAGER1 | 21 | 10 | 8 | 8 | 6 | 5 | 8 | 65 | 13 | 8 | 11 | 7 | 5 | 5 | 5 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 |
| HAGER1 | 101 | 50 | 10 | 11 | 13 | 7 | 7 | 485 | 18 | 10 | 10 | 9 | 4 | 4 | 6 | 10 | 10 | 7 | 10 | 10 | 10 | 10 | 10 |
| HAGER1 | 201 | 100 | 11 | 9 | 24 | 12 | 7 | —I— | 21 | 11 | 11 | 11 | 4 | 4 | 17 | 11 | 10 | 7 | 11 | 11 | 11 | 11 | 11 |
| HAGER1 | 1001 | 500 | 13 | 8 | 107 | 50 | 9 | —I— | 27 | 13 | 13 | 12 | 4 | 4 | 19 | 13 | 12 | 7 | 13 | 13 | 13 | 13 | 13 |
| HAGER1 | 2001 | 1000 | 13 | 10 | 212 | 99 | 8 | —I— | 31 | 13 | 13 | 15 | 4 | 4 | 16 | 13 | 12 | 7 | 13 | 13 | 13 | 13 | 13 |
| HAGER1 | 10001 | 5000 | 12 | 9 | —M— | —T— | —T— | —T— | —T— | 12 | 12 | 14 | 23 | —M— | 15 | 12 | 23 | 8 | 12 | 12 | 12 | 12 | 12 |
| HAGER2 | 21 | 10 | 9 | 13 | 7 | 6 | 6 | 62 | 12 | 9 | 11 | 8 | 6 | 6 | 6 | 9 | 10 | 9 | 9 | 18 | 9 | 9 | 9 |
| HAGER2 | 101 | 50 | 10 | 13 | 13 | 7 | 7 | 464 | 17 | 10 | 10 | 10 | 4 | 4 | 6 | 10 | 12 | 9 | 10 | 19 | 10 | 10 | 10 |
| HAGER2 | 201 | 100 | 11 | 10 | 24 | 13 | 6 | —I— | 17 | 11 | 11 | 12 | 5 | 5 | 16 | 11 | 12 | 9 | 11 | 17 | 11 | 11 | 11 |
| HAGER2 | 1001 | 500 | 12 | 16 | 106 | 51 | 8 | —I— | 27 | 12 | 12 | 14 | 5 | 5 | 18 | 12 | 13 | 8 | 11 | 19 | 11 | 11 | 11 |
| HAGER2 | 2001 | 1000 | 12 | 11 | —T— | 100 | 7 | —I— | 25 | 12 | 12 | —T— | 5 | —T— | 15 | 12 | 13 | 7 | 12 | 14 | 12 | 12 | 12 |
| HAGER2 | 10001 | 5000 | 11 | —S— | —M— | —I— | —T— | —T— | —T— | 11 | 11 | —E— | 22 | —M— | 15 | 11 | 28 | 6 | 9 | ( 10) | 9 | 9 | 9 |
| HAGER3 | 21 | 10 | 8 | 13 | 4 | 4 | 7 | 71 | 13 | 8 | 10 | 7 | 4 | 4 | 4 | 8 | 10 | 8 | 11 | 13 | 10 | 9 | 9 |
| HAGER3 | 101 | 50 | 11 | 13 | 5 | 5 | 6 | 512 | 17 | 11 | 11 | 11 | 5 | 5 | 7 | 11 | 11 | 8 | 12 | 13 | 12 | 11 | 11 |
| HAGER3 | 201 | 100 | 12 | 11 | 6 | 6 | 6 | —I— | 18 | 12 | 12 | 12 | 5 | 5 | 17 | 12 | 12 | 7 | 13 | 15 | 13 | 12 | 13 |
| HAGER3 | 1001 | 500 | 13 | 13 | 18 | 18 | 8 | —I— | 25 | 13 | 13 | 14 | 5 | 5 | 18 | 13 | 13 | 7 | 13 | 14 | 12 | 13 | 13 |
| HAGER3 | 2001 | 1000 | 13 | 11 | —T— | 33 | 7 | —I— | 29 | 13 | 13 | —T— | 5 | —T— | 15 | 13 | 10 | 7 | 15 | 20 | 13 | 13 | 13 |
| HAGER3 | 10001 | 5000 | 9 | —S— | —M— | —I— | —T— | —T— | —T— | 9 | 9 | —M— | 21 | —M— | 15 | 9 | 22 | 6 | 10 | 15 | 9 | 9 | 9 |
| HAGER4 | 21 | 10 | 10 | 17 | 13 | 7 | 9 | 276 | 15 | 11 | 8 | 9 | 8 | 8 | 8 | 8 | 9 | 7 | 16 | 23 | 17 | 16 | 18 |
| HAGER4 | 101 | 50 | 13 | 16 | 53 | 10 | 11 | —I— | 28 | 13 | 13 | 9 | 7 | 7 | 9 | 11 | 13 | 11 | 15 | 23 | 16 | 16 | 23 |
| HAGER4 | 201 | 100 | 13 | 15 | 106 | 13 | 11 | —I— | 55 | 13 | 13 | 8 | 7 | 7 | 12 | 12 | 16 | 11 | 15 | 18 | 18 | 15 | 25 |
| HAGER4 | 1001 | 500 | 14 | 20 | —T— | 46 | 10 | —I— | —T— | 14 | 14 | 9 | 9 | 9 | 24 | 14 | 16 | 13 | 13 | 26 | 14 | 14 | 35 |
| HAGER4 | 2001 | 1000 | 11 | 23 | —T— | 85 | —T— | —I— | —T— | 11 | 11 | 11 | 10 | —T— | 22 | 13 | 18 | 13 | 15 | 35 | 15 | 14 | 37 |
| HAGER4 | 10001 | 5000 | —T— | —T— | —M— | —T— | —T— | —I— | —T— | 13 | —T— | —T— | 18 | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| HAIRY | 2 | 0 | 85 | 94 | 63 | 69 | 83 | 96 | 112 | 85 | 85 | 81 | 70 | 83 | 91 | 73 | 75 | 60 | 67 | —S— | 89 | 81 | 96 |
| HATFLDA | 4 | 0 | 24 | 24 | 32 | 24 | 29 | 29 | 30 | 24 | 24 | 30 | 24 | 32 | 25 | 25 | 25 | 24 | 29 | 29 | 29 | 28 | 28 |
| HATFLDB | 4 | 0 | 21 | 21 | 21 | 22 | 26 | 26 | 27 | 21 | 21 | 27 | 21 | 22 | 22 | 21 | 21 | 22 | 23 | 23 | 26 | 25 | 25 |
| HATFLDC | 25 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| HATFLDD | 3 | 0 | 20 | 20 | 15 | 16 | 15 | 27 | 21 | 14 | 20 | 19 | 11 | 13 | 26 | 21 | 30 | 20 | 28 | —I— | 20 | 22 | 18 |
| HATFLDE | 3 | 0 | 21 | 21 | 22 | 18 | 16 | 22 | 20 | 14 | 21 | 17 | 12 | 15 | 23 | 21 | 21 | 19 | 24 | —I— | 25 | 22 | 16 |
| HATFLDF | 3 | 0 | 23 | 72 | 39 | 37 | 53 | 15 | 12 | 23 | 23 | 34 | 33 | 37 | 28 | 26 | 22 | 37 | 24 | —I— | 23 | 13 | 13 |
| HATFLDG | 25 | 0 | 15 | 15 | 13 | 13 | 14 | 11 | 13 | 15 | 14 | 13 | 13 | 11 | 15 | 15 | 14 | 13 | 20 | —I— | 13 | 13 | 14 |

Number of gradient evaluations ( 7 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HATFLDH | 4 | 7 | 12 | 11 | 63 | 19 | 11 | 35 | 16 | 16 | 10 | 14 | 10 | 10 | 11 | 10 | 12 | 12 | 103 | —I— | 19 | 13 | 14 |
| HELIX | 3 | 0 | 12 | —S— | 13 | 13 | 13 | 68 | 13 | 12 | 12 | 13 | 11 | 13 | 11 | 14 | 14 | 11 | 20 | —I— | 19 | 19 | 19 |
| HILBERTA | 2 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTA | 4 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTA | 5 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTA | 6 | 0 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTA | 10 | 0 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTB | 5 | 0 | 3 | 3 | 3 | 3 | 3 | 13 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTB | 10 | 0 | 3 | 3 | 3 | 3 | 3 | 13 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| HILBERTB | 50 | 0 | 3 | 7 | 3 | 3 | 3 | 13 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| HIMMELBA | 2 | 0 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| HIMMELBB | 2 | 0 | 12 | 6 | 16 | 19 | 20 | 144 | 14 | 12 | 12 | 19 | 22 | 19 | 12 | 12 | 12 | 12 | 12 | 12 | 23 | 15 | 15 |
| HIMMELBC | 2 | 0 | 8 | 8 | 8 | 8 | 8 | 13 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 7 | 8 | 8 | 7 | 8 | 8 | 8 |
| HIMMELBD | 2 | 0 | 34 | 31 | 38 | 30 | 32 | —I— | 36 | 34 | 34 | 36 | 34 | 34 | 34 | —S— | 50 | 36 | 33 | —S— | 33 | 33 | 34 |
| HIMMELBE | 3 | 0 | 4 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 4 | 6 | 4 | 4 | 4 | 5 | 6 | 4 | 4 | 4 | 4 | 4 | 4 |
| HIMMELBF | 4 | 0 | 196 | 351 | —I— | 300 | 292 | —I— | 391 | 186 | 196 | 305 | 270 | 166 | 120 | 480 | 172 | 149 | 272 | —S— | 80 | 33 | 50 |
| HIMMELBG | 2 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 20 | 10 | 9 | 10 |
| HIMMELBH | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 19 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| HIMMELBI | 100 | 12 | 38 | 41 | —I— | 80 | 26 | —I— | 32 | 29 | 40 | 37 | 18 | —E— | 22 | 35 | 319 | 27 | 132 | —E— | 335 | 128 | 106 |
| HIMMELBJ | 45 | 14 | —I— | —I— | 799 | 923 | —I— | 560 | —I— | —I— | —I— | —I— | —S— | 144 | —I— | —I— | —I— | 283 | —I— | —I— | —I— | —I— | —I— |
| HIMMELBK | 24 | 14 | 118 | ( 13) | —I— | 202 | 111 | —I— | 124 | 123 | ( 16) | 116 | ( 15) | 93 | 96 | 123 | 131 | 96 | 228 | —I— | 167 | 138 | 140 |
| HONG | 4 | 1 | 18 | 18 | 17 | 17 | 19 | 28 | 24 | 22 | 18 | 22 | 18 | 18 | 18 | 18 | 19 | 19 | 25 | 70 | 25 | 25 | 25 |
| HS1 | 2 | 0 | 29 | 49 | 28 | 30 | 28 | 80 | 35 | 29 | 29 | 34 | 31 | 30 | 31 | 29 | 30 | 30 | 28 | 28 | 24 | 24 | 24 |
| HS10 | 2 | 1 | 18 | 18 | 21 | 21 | 19 | —I— | 22 | 18 | 18 | 21 | 18 | 18 | 18 | 18 | 20 | 21 | 31 | 27 | 24 | 20 | 23 |
| HS100 | 7 | 4 | 47 | 48 | 33 | 21 | 29 | 501 | 38 | 50 | 35 | 39 | 30 | 29 | 45 | 48 | 288 | 29 | 59 | —I— | 47 | 43 | —I— |
| HS100MOD | 7 | 4 | 138 | —S— | 45 | —I— | 103 | —I— | —S— | —S— | —S— | 101 | 78 | 43 | 111 | —S— | —I— | 52 | 147 | —I— | 147 | —S— | —I— |
| HS101 | 7 | 5 | —I— | 114 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS102 | 7 | 5 | —I— | 130 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS103 | 7 | 5 | —I— | —S— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS104 | 8 | 5 | 54 | 42 | 58 | 33 | 48 | 161 | 44 | 70 | 37 | 64 | 31 | 27 | 36 | 54 | 53 | 43 | 115 | —I— | 67 | 63 | 118 |
| HS105 | 8 | 1 | ( 14) | 24 | ( 14) | 17 | 24 | ( 13) | ( 13) | ( 14) | ( 12) | 17 | ( 13) | ( 13) | 16 | ( 14) | ( 11) | ( 20) | —I— | —I— | 477 | ( 89) | —E— |
| HS106 | 8 | 6 | —I— | 72 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS107 | 9 | 6 | 31 | 38 | 40 | 33 | —S— | 378 | 35 | 34 | 23 | 35 | 23 | 24 | 23 | 31 | 32 | 31 | —S— | —I— | 37 | 42 | 42 |
| HS108 | 9 | 13 | 23 | 23 | 51 | 18 | 18 | 36 | 23 | 21 | 35 | 19 | 14 | 24 | 16 | 23 | 22 | 19 | 35 | —I— | 26 | 26 | 26 |
| HS109 | 9 | 10 | —I— | 203 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS11 | 2 | 1 | 16 | 16 | 15 | 15 | 16 | 88 | 17 | 16 | 16 | 16 | 16 | 16 | 16 | 15 | 16 | 17 | 16 | 27 | 16 | 16 | 16 |
| HS110 | 10 | 0 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 17 | 17 | 8 | 8 | 8 |
| HS111 | 10 | 3 | 46 | 46 | 46 | 36 | 48 | 51 | 54 | 53 | 46 | 65 | 40 | 51 | 51 | 50 | 46 | 47 | —I— | —I— | —I— | 145 | —I— |
| HS112 | 10 | 3 | 43 | 43 | 39 | 38 | 45 | 53 | 58 | 44 | 39 | 48 | 39 | 39 | 39 | 43 | 44 | 42 | 57 | —I— | 46 | 48 | 58 |
| HS113 | 10 | 8 | 75 | 52 | 44 | 33 | 45 | 600 | 59 | 87 | 72 | 64 | 35 | 35 | 35 | 69 | 822 | 40 | 68 | —I— | 67 | 84 | —I— |
| HS114 | 10 | 11 | 711 | 123 | —I— | —I— | —I— | —I— | —S— | 647 | 701 | 494 | —S— | 278 | —I— | 750 | —S— | 369 | —I— | —I— | —I— | 789 | —I— |
| HS116 | 13 | 14 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS117 | 15 | 5 | 60 | 53 | —I— | —I— | 64 | 508 | 46 | 33 | 86 | 58 | 37 | 45 | 42 | 46 | 83 | 53 | 471 | —I— | 67 | 58 | —I— |
| HS118 | 15 | 17 | 17 | 17 | —I— | 10 | 18 | 257 | 18 | 16 | 17 | 16 | 9 | 9 | 15 | 17 | 19 | 14 | 17 | 17 | 17 | 17 | 16 |
| HS119 | 16 | 8 | 30 | 36 | 55 | 44 | 24 | 130 | 31 | 33 | 29 | 29 | 28 | 28 | 28 | 30 | 30 | 30 | 100 | —I— | 40 | 40 | 59 |
| HS12 | 2 | 1 | 22 | 22 | 21 | 20 | 20 | 533 | 21 | 24 | 22 | 21 | 22 | 22 | 22 | 22 | 101 | 20 | 31 | —I— | 25 | 22 | 28 |
| HS13 | 2 | 1 | 58 | 54 | 58 | 58 | 58 | 64 | 58 | 57 | 58 | 58 | 58 | 58 | 58 | 58 | 57 | 58 | 170 | 166 | 68 | 68 | 68 |
| HS14 | 2 | 2 | 13 | 13 | 13 | 13 | 13 | 24 | 15 | 13 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 15 | 14 | 14 | 14 |
| HS15 | 2 | 2 | 45 | 45 | 56 | 53 | 38 | 488 | 46 | 45 | 45 | 44 | 46 | 46 | 45 | 45 | 46 | 45 | 81 | 112 | 50 | 69 | 91 |
| HS16 | 2 | 2 | 15 | 15 | 13 | 14 | 17 | 25 | 19 | 16 | 15 | 17 | 15 | 16 | 16 | 15 | 17 | 14 | 24 | 47 | 28 | 26 | 29 |
| HS17 | 2 | 2 | 18 | 18 | 16 | 18 | 20 | 29 | 20 | 20 | 18 | 21 | 19 | 18 | 18 | 18 | 18 | 18 | 28 | —S— | 30 | 33 | 36 |
| HS18 | 2 | 2 | 80 | 101 | 67 | 62 | 133 | 820 | 143 | 133 | 80 | 157 | 69 | 69 | 69 | 80 | 87 | 82 | 112 | —I— | 96 | 85 | 94 |
| HS19 | 2 | 2 | 34 | —S— | 36 | 34 | 29 | —I— | 35 | 35 | 34 | 34 | 33 | 34 | 34 | 34 | 97 | 34 | 36 | 33 | 35 | 35 | 37 |
| HS2 | 2 | 0 | 7 | 12 | 7 | 7 | 7 | 40 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 5 | 5 | 5 |
| HS20 | 2 | 3 | 22 | 22 | 25 | 23 | 22 | 53 | 28 | 26 | 22 | 25 | 22 | 22 | 22 | 22 | 21 | 22 | 21 | 31 | 22 | 21 | 21 |
| HS21 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 8 | 9 | 8 | 8 | 8 |
| HS22 | 2 | 2 | 10 | 10 | 10 | 10 | 10 | 18 | 11 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 13 | 12 | 13 | 13 | 13 |
| HS23 | 2 | 5 | 42 | 22 | 52 | 52 | 58 | 267 | 54 | 65 | 42 | 65 | 53 | 46 | 48 | 42 | 83 | 54 | 40 | 41 | 40 | 40 | 40 |
| HS24 | 2 | 3 | 8 | 8 | 9 | 10 | 8 | 21 | 10 | 11 | 8 | 10 | 8 | 8 | 8 | 8 | 9 | 8 | 21 | 21 | 14 | 14 | 14 |

Number of gradient evaluations ( 8 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS25 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HS26 | 3 | 1 | 34 | 38 | 37 | 36 | 28 | 82 | 25 | 31 | 34 | 31 | 30 | 29 | 31 | 34 | 29 | 28 | 31 | —I— | 31 | 27 | 27 |
| HS27 | 3 | 1 | 16 | 23 | 16 | 17 | 21 | 24 | 15 | 16 | 16 | 17 | 15 | 15 | 16 | 16 | 13 | 17 | 27 | 93 | 25 | 21 | 25 |
| HS28 | 3 | 1 | 4 | 4 | 4 | 4 | 4 | 23 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 15 | 4 | 4 | 4 |
| HS29 | 3 | 1 | 27 | 27 | 26 | 27 | 19 | 134 | 31 | 35 | 27 | 31 | 24 | 26 | 28 | 26 | 65 | 27 | 27 | 36 | 28 | 31 | 30 |
| HS3 | 2 | 0 | 5 | 5 | 5 | 5 | 5 | 2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| HS30 | 3 | 1 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 9 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 14 | 10 | 10 | 10 |
| HS31 | 3 | 1 | 13 | 13 | 12 | 12 | 11 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 14 | 27 | —I— | 18 | 15 | 22 |
| HS32 | 3 | 2 | 12 | 17 | 12 | 7 | 11 | 29 | 14 | 11 | 11 | 13 | 12 | 11 | 11 | 12 | 9 | 7 | 13 | 14 | 13 | 13 | 13 |
| HS33 | 3 | 2 | ( 12) | ( 13) | ( 13) | ( 12) | ( 12) | ( 28) | ( 12) | ( 14) | ( 12) | ( 14) | ( 12) | ( 12) | ( 12) | ( 12) | ( 13) | ( 13) | ( 12) | ( 11) | ( 12) | ( 12) | 26 |
| HS34 | 3 | 2 | 19 | 19 | 17 | 17 | 17 | 28 | 20 | 19 | 19 | 17 | 18 | 18 | 19 | 19 | 18 | 20 | 22 | 22 | 20 | 20 | 20 |
| HS35 | 3 | 1 | 7 | 7 | 6 | 5 | 7 | 8 | 6 | 8 | 7 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 45 | —I— | 18 | 10 | 30 |
| HS36 | 3 | 1 | 12 | 12 | 16 | 12 | 13 | 214 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 17 | 12 | 19 | 18 | 18 | 16 | 16 |
| HS37 | 3 | 2 | 17 | 17 | 21 | 19 | 20 | 479 | 23 | 21 | 17 | 23 | 17 | 18 | 18 | 18 | 50 | 18 | 56 | 319 | 44 | 37 | 66 |
| HS38 | 4 | 0 | 51 | 51 | 49 | 73 | 51 | 190 | 60 | 54 | 51 | 50 | 49 | 50 | 51 | 50 | 42 | 45 | —I— | —I— | 47 | 50 | 25 |
| HS39 | 4 | 2 | 21 | 19 | 21 | 20 | 20 | 40 | 24 | 20 | 21 | 23 | 21 | 21 | 21 | 21 | 21 | 23 | 476 | 476 | 27 | 27 | 27 |
| HS4 | 2 | 0 | 3 | 2 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| HS40 | 4 | 3 | 11 | 11 | 10 | 10 | 11 | 10 | 13 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 14 | 64 | 15 | 15 | 18 |
| HS41 | 4 | 1 | 7 | 7 | 7 | 6 | 7 | 9 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 7 | 6 | 7 | 12 | 16 | 14 | 12 | 12 |
| HS42 | 4 | 2 | 13 | 11 | 11 | 11 | 12 | 11 | 14 | 13 | 13 | 12 | 13 | 13 | 13 | 13 | 11 | 13 | 13 | 18 | 13 | 13 | 13 |
| HS43 | 4 | 3 | 21 | 21 | 26 | 20 | 23 | 44 | 26 | 27 | 21 | 30 | 21 | 21 | 22 | 23 | 156 | 20 | 440 | —I— | 27 | 27 | 27 |
| HS44 | 4 | 6 | 7 | 7 | ( 15) | ( 44) | 11 | ( 74) | ( 13) | ( 12) | 7 | ( 13) | ( 7) | ( 8) | ( 7) | 7 | 27 | 7 | 29 | —I— | 10 | 9 | 9 |
| HS45 | 5 | 0 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| HS46 | 5 | 2 | 24 | 24 | 27 | 21 | 18 | 17 | 22 | 30 | 24 | 23 | 17 | 21 | 24 | 24 | 20 | 19 | 25 | 39 | 16 | 23 | 22 |
| HS47 | 5 | 3 | ( 21) | 74 | 72 | 71 | ( 22) | ( 21) | ( 25) | ( 23) | ( 21) | ( 22) | ( 21) | ( 21) | ( 22) | ( 21) | ( 22) | ( 23) | ( 24) | ( 29) | ( 23) | ( 23) | ( 23) |
| HS48 | 5 | 2 | 4 | 4 | 4 | 4 | 7 | 23 | 9 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 19 | 4 | 4 | 4 |
| HS49 | 5 | 2 | 16 | 16 | 16 | 16 | 17 | 65 | 20 | 20 | 16 | 19 | 16 | 16 | 16 | 16 | 16 | 16 | 25 | 31 | 25 | 25 | 35 |
| HS5 | 2 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 |
| HS50 | 5 | 3 | 13 | 14 | 13 | 11 | 15 | 241 | 14 | 15 | 13 | 15 | 13 | 13 | 13 | 12 | 11 | 11 | 19 | 26 | 19 | 19 | 19 |
| HS51 | 5 | 3 | 3 | 3 | 3 | 3 | 8 | 13 | 10 | 11 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 24 | 3 | 3 | 3 |
| HS52 | 5 | 3 | 7 | 7 | 7 | 7 | 11 | 35 | 14 | 13 | 7 | 11 | 7 | 7 | 7 | 7 | 8 | 7 | 11 | 27 | 11 | 11 | 11 |
| HS53 | 5 | 3 | 7 | 7 | 7 | 7 | 11 | 31 | 13 | 11 | 7 | 12 | 7 | 7 | 7 | 7 | 8 | 7 | 12 | 14 | 12 | 12 | 12 |
| HS54 | 6 | 1 | ( 3) | —S— | ( 3) | ( 3) | ( 3) | 21 | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 40) | ( 40) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) |
| HS55 | 6 | 6 | 7 | 7 | 6 | 6 | 9 | 8 | 9 | 7 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 7 | 8 | 8 | 9 | 9 | 9 |
| HS56 | 7 | 4 | 17 | 16 | 16 | 21 | 22 | 23 | 14 | 19 | 13 | 26 | 19 | 17 | 15 | 16 | 12 | 13 | —I— | —I— | 29 | 25 | 60 |
| HS57 | 2 | 1 | ( 2) | 14 | 14 | —I— | ( 4) | 10 | 17 | ( 5) | ( 2) | 13 | 17 | 13 | 13 | ( 2) | ( 2) | ( 2) | ( 10) | ( 24) | ( 7) | ( 7) | ( 7) |
| HS59 | 2 | 3 | 335 | 64 | ( 355) | ( 238) | 398 | —I— | 371 | 378 | 335 | 390 | 328 | 320 | 310 | 335 | —I— | ( 305) | 460 | —I— | 330 | 350 | 513 |
| HS6 | 2 | 1 | 49 | 49 | 41 | 47 | 46 | 86 | 53 | 49 | 49 | 53 | 49 | 44 | 44 | 47 | 48 | 54 | 42 | 42 | 40 | 40 | 40 |
| HS60 | 3 | 1 | 15 | 18 | 27 | 11 | 15 | 40 | 23 | 22 | 15 | 18 | 14 | 23 | 21 | 14 | 14 | 11 | 22 | 25 | 24 | 17 | 17 |
| HS61 | 3 | 2 | 18 | 18 | 18 | 17 | 16 | 93 | 21 | 20 | 18 | 20 | 18 | 18 | 18 | 19 | 18 | 17 | 17 | 28 | 17 | 17 | 17 |
| HS62 | 3 | 1 | 33 | 33 | 38 | 33 | 33 | 306 | 34 | 33 | 33 | 34 | 33 | 33 | 33 | 33 | 33 | 33 | —I— | —I— | 48 | 48 | 48 |
| HS63 | 3 | 2 | 14 | 14 | 24 | 14 | 14 | 114 | 14 | 17 | 14 | 14 | 17 | 16 | 21 | 14 | 17 | 12 | 45 | 36 | 19 | 20 | 20 |
| HS64 | 3 | 1 | 51 | 47 | 50 | 50 | 52 | 604 | 51 | 52 | 51 | 51 | 51 | 51 | 51 | 51 | 51 | —T— | 64 | 66 | 64 | 64 | 65 |
| HS65 | 3 | 1 | 27 | 27 | 33 | 29 | 34 | 104 | 38 | 54 | 27 | 35 | 27 | 28 | 29 | 27 | 47 | 38 | 33 | 26 | 33 | 33 | 33 |
| HS66 | 3 | 2 | 9 | 13 | 9 | 9 | 11 | 8 | 11 | 9 | 9 | 10 | 8 | 9 | 9 | 9 | 8 | 9 | 11 | 16 | 11 | 11 | 11 |
| HS67 | 3 | 14 | 52 | 28 | —I— | 68 | 100 | 21 | 39 | 40 | 39 | 38 | 46 | 30 | 42 | 52 | 52 | 56 | —I— | —I— | 166 | 60 | —S— |
| HS68 | 4 | 2 | 81 | —I— | 71 | 74 | 99 | 485 | 101 | 89 | 81 | 98 | 78 | 83 | 78 | 81 | 81 | 83 | —I— | —I— | 123 | 117 | —I— |
| HS69 | 4 | 2 | 34 | 84 | 34 | 33 | 34 | —S— | 41 | —S— | 34 | 36 | 34 | 35 | 34 | 34 | —S— | 34 | —I— | —I— | 79 | —S— | —I— |
| HS7 | 2 | 1 | 18 | 18 | 17 | 17 | 19 | 102 | 17 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 17 | 18 | 19 | 24 | 19 | 19 | 19 |
| HS70 | 4 | 1 | 28 | 28 | ( 23) | 21 | 27 | ( 314) | 21 | 24 | 28 | 16 | 21 | 35 | 26 | 26 | 23 | 25 | —I— | —I— | 35 | 37 | 35 |
| HS71 | 4 | 2 | 15 | 15 | 20 | 14 | 15 | 47 | 17 | 17 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 27 | —I— | 18 | 21 | 23 |
| HS72 | 4 | 2 | 90 | 90 | 90 | 89 | 237 | 97 | 90 | 92 | 90 | 91 | 90 | 90 | 89 | 90 | 98 | —T— | 112 | 113 | 112 | 112 | 112 |
| HS73 | 4 | 3 | 16 | 17 | —I— | 20 | 17 | 455 | 24 | 19 | 16 | 24 | 21 | 23 | 22 | 16 | 111 | 16 | 19 | 18 | 19 | 19 | 19 |
| HS74 | 4 | 5 | 28 | 28 | 20 | 20 | 23 | —I— | 22 | 29 | 28 | 25 | 20 | 20 | 24 | 28 | 27 | 25 | —S— | 44 | 28 | 28 | 50 |
| HS75 | 4 | 5 | —S— | 29 | —S— | —I— | —I— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS76 | 4 | 3 | 7 | 7 | 13 | 7 | 8 | 17 | 9 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 23 | —I— | 10 | 14 | 19 |
| HS77 | 5 | 2 | 22 | 15 | 27 | 18 | 20 | ( 121) | 24 | 19 | 22 | 34 | 19 | 21 | 25 | 22 | 22 | 23 | 30 | —I— | 22 | 24 | 24 |
| HS78 | 5 | 3 | 11 | 11 | 10 | 10 | 9 | 16 | 14 | 14 | 11 | 11 | 11 | 10 | 12 | 12 | 12 | 10 | 15 | 22 | 13 | 13 | 30 |
| HS79 | 5 | 3 | 13 | 13 | 14 | 12 | 11 | 23 | 12 | 14 | 13 | 13 | 9 | 10 | 10 | 13 | 13 | 10 | 13 | 19 | 13 | 15 | 15 |

Number of gradient evaluations ( 9 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS8 | 2 | 2 | 11 | 11 | 11 | 10 | 10 | 50 | 10 | 11 | 11 | 10 | 9 | 9 | 10 | 9 | 10 | 10 | 10 | 9 | 9 | 9 | 9 |
| HS80 | 5 | 3 | 14 | 14 | 18 | 11 | 13 | 21 | 16 | 15 | 14 | 19 | 12 | 11 | 18 | 13 | 15 | 11 | 17 | 17 | 11 | 15 | 23 |
| HS81 | 5 | 3 | 16 | ( 183) | 17 | 11 | 13 | 20 | 15 | 17 | 16 | 16 | 13 | 11 | 17 | 15 | 16 | 14 | 823 | 32 | 16 | 18 | 26 |
| HS83 | 5 | 3 | 24 | 20 | 50 | 24 | 23 | 225 | 24 | 25 | 24 | 25 | 24 | 28 | 24 | 23 | 23 | 26 | 32 | 31 | 25 | 25 | 30 |
| HS84 | 5 | 3 | —S— | —S— | —I— | —I— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS85 | 5 | 21 | —I— | 45 | —I— | —I— | —I— | —I— | —S— | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —S— | —S— | —I— |
| HS86 | 5 | 10 | —S— | 18 | —I— | 55 | 15 | 98 | 15 | 15 | 17 | 15 | 16 | 19 | 19 | —S— | 31 | 19 | 413 | —I— | 36 | 22 | 77 |
| HS87 | 6 | 4 | 88 | —S— | —I— | —S— | —S— | —I— | —S— | —S— | 104 | —S— | —S— | —S— | 31 | 114 | 33 | 36 | —I— | —I— | 45 | 125 | —S— |
| HS88 | 2 | 1 | 53 | 53 | 52 | 52 | 46 | 54 | 53 | 53 | 53 | 52 | 53 | 53 | 53 | 53 | 53 | 53 | 98 | 154 | 93 | 79 | 70 |
| HS89 | 3 | 1 | ( 61) | ( 61) | ( 56) | ( 60) | ( 57) | ( 53) | ( 55) | ( 60) | ( 61) | ( 60) | 55 | ( 59) | ( 56) | ( 58) | ( 98) | —T— | ( 167) | ( 183) | ( 94) | ( 84) | ( 91) |
| HS9 | 2 | 1 | 5 | 5 | 6 | 5 | 7 | 40 | 7 | 5 | 5 | 7 | 5 | 5 | 5 | 5 | 6 | 7 | 11 | 12 | 11 | 11 | 11 |
| HS90 | 4 | 1 | —E— | —E— | —E— | —E— | —E— | 57 | —E— | —E— | —E— | 54 | —E— | —E— | —E— | 57 | 56 | 57 | —E— | 147 | —E— | —E— | —E— |
| HS91 | 5 | 1 | —E— | —E— | 76 | —E— | 57 | —E— | —E— | ( 85) | —E— | —E— | —E— | —E— | —E— | ( 102) | ( 66) | 57 | —E— | —I— | —E— | —E— | —E— |
| HS92 | 6 | 1 | —E— | —E— | —E— | —E— | —E— | 951 | —E— | —E— | —E— | —E— | 55 | 57 | —E— | 57 | 54 | 55 | —E— | —I— | —E— | —E— | —E— |
| HS93 | 6 | 2 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HS95 | 6 | 4 | 8 | 26 | —I— | 19 | 7 | 115 | 10 | 16 | 8 | 6 | 15 | 7 | 12 | 8 | 10 | 25 | 15 | 13 | 6 | 17 | 13 |
| HS96 | 6 | 4 | 8 | 23 | —I— | 22 | 29 | 103 | 10 | 16 | 16 | 6 | 15 | 7 | 5 | 8 | 11 | 17 | 15 | 13 | 7 | 7 | 12 |
| HS97 | 6 | 4 | 20 | ( 23) | ( 484) | ( 10) | ( 8) | ( 161) | ( 8) | ( 18) | 23 | ( 15) | ( 7) | ( 17) | ( 32) | 20 | ( 50) | ( 7) | ( 42) | —I— | ( 25) | ( 21) | ( 49) |
| HS98 | 6 | 4 | 17 | 46 | —I— | ( 9) | ( 7) | ( 161) | ( 8) | ( 28) | 21 | ( 13) | ( 7) | ( 9) | ( 30) | 24 | ( 43) | ( 7) | ( 16) | ( 35) | ( 20) | ( 20) | ( 38) |
| HS99 | 7 | 2 | —I— | —S— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —I— | —I— | —E— | —F— | —I— |
| HS99EXP | 31 | 21 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —I— | —F— | —I— | —I— | —E— | —I— | —I— | —I— | —I— | —I— | —I— |
| HUBFIT | 2 | 0 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| HYDCAR20 | 99 | 99 | —F— | —E— | —F— | 128 | 64 | —E— | —F— | —F— | —F— | 97 | 121 | 161 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDCAR6 | 29 | 29 | —F— | —E— | —F— | 52 | —F— | 28 | —F— | —F— | —F— | 36 | 66 | 70 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDROELL | 1009 | 1008 | 129 | 247 | —I— | —I— | 140 | —I— | 135 | 129 | 129 | 130 | 140 | 126 | 136 | 132 | —I— | 128 | —I— | —I— | 654 | 828 | —I— |
| HYDROELM | 505 | 504 | 80 | 194 | —I— | —I— | 84 | —I— | 76 | 80 | 80 | 73 | 68 | 67 | 75 | 78 | —I— | 73 | —I— | —I— | 413 | —I— | —I— |
| HYDROELS | 169 | 168 | 38 | 144 | —I— | —I— | 37 | —I— | 37 | 38 | 38 | 31 | 32 | 29 | 36 | 35 | —I— | 35 | —I— | —I— | 469 | —I— | —I— |
| HYPCIR | 2 | 0 | 8 | 13 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 6 | 8 | 7 | 7 | 7 | 8 | 7 |
| INTEGREQ | 12 | 0 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| INTEGREQ | 52 | 0 | 4 | 7 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| INTEGREQ | 102 | 0 | 4 | —S— | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| JENSMP | 2 | 0 | 10 | 10 | 10 | 10 | 10 | 94 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | —I— | 9 | 9 | 9 |
| JNLBRNG1 | 16 | 0 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 9 | 3 | 3 | 3 |
| JNLBRNG1 | 100 | 0 | 4 | 6 | 2 | 2 | 4 | 5 | 4 | 4 | 2 | 2 | 2 | 2 | 3 | 4 | 6 | 5 | 5 | 26 | 5 | 5 | 5 |
| JNLBRNG1 | 529 | 0 | 6 | —S— | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 6 | 8 | 7 | 7 | 282 | 7 | 7 | 7 |
| JNLBRNG1 | 1024 | 0 | 7 | 8 | 6 | 6 | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 7 | 8 | 7 | 8 | 553 | 8 | 8 | 8 |
| JNLBRNG1 | 5625 | 0 | 15 | 18 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 16 | —I— | 16 | 16 | 16 |
| JNLBRNG1 | 10000 | 0 | 20 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | —T— | 21 | 21 | 21 |
| JNLBRNG1 | 15625 | 0 | 25 | —I— | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | —T— | 26 | 26 | 26 |
| JNLBRNG2 | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 6 | 3 | 3 | 3 |
| JNLBRNG2 | 100 | 0 | 4 | 6 | 3 | 3 | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 70 | 5 | 5 | 5 |
| JNLBRNG2 | 529 | 0 | 5 | —S— | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 5 | 6 | 6 | 5 | 757 | 5 | 5 | 5 |
| JNLBRNG2 | 1024 | 0 | 5 | 7 | 4 | 4 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 7 | 6 | 6 | 912 | 6 | 6 | 6 |
| JNLBRNG2 | 5625 | 0 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 10 | 11 | —I— | 11 | 11 | 11 |
| JNLBRNG2 | 10000 | 0 | 12 | 14 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 12 | 13 | —I— | 13 | 13 | 13 |
| JNLBRNG2 | 15625 | 0 | 15 | —I— | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 16 | 15 | 16 | —T— | 16 | 16 | 16 |
| KOWOSB | 4 | 0 | 8 | 13 | 14 | 10 | 14 | 10 | 9 | 10 | 8 | 12 | 10 | 8 | 9 | 8 | 9 | 11 | 13 | —S— | 11 | 22 | 22 |
| LCH | 30 | 1 | 28 | —F— | —I— | 20 | ( 22) | ( 37) | ( 21) | 28 | 26 | 29 | 27 | 25 | 30 | 28 | 31 | 32 | —I— | —I— | 45 | 67 | 65 |
| LCH | 150 | 1 | 29 | —F— | ( 22) | 546 | ( 23) | 193 | 33 | 31 | 30 | 28 | 29 | 27 | 29 | 30 | 34 | 31 | —I— | —I— | 45 | 64 | 62 |
| LCH | 300 | 1 | 33 | —F— | 34 | 565 | ( 25) | 416 | 37 | 34 | 32 | 29 | 31 | 28 | 29 | 33 | 32 | 33 | —I— | —I— | 44 | 89 | 90 |
| LCH | 600 | 1 | 35 | —F— | —T— | —T— | ( 27) | 916 | 37 | 37 | 36 | 33 | 38 | 33 | 39 | 34 | 36 | 39 | —I— | —I— | 50 | 71 | 68 |
| LEAKNET | 156 | 153 | —S— | —F— | —I— | —I— | —I— | —I— | —S— | —I— | —S— | 96 | 68 | 69 | —I— | —S— | ( 427) | —S— | —I— | —I— | —S— | —S— | —I— |
| LEWISPOL | 6 | 9 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| LIARWHD | 36 | 0 | 12 | 25 | 15 | 14 | 11 | 117 | 11 | 12 | 15 | 15 | 11 | 11 | 11 | 16 | 20 | 12 | 12 | 15 | 12 | 12 | 12 |
| LIARWHD | 100 | 0 | 18 | 28 | 17 | 17 | 14 | 157 | 16 | 16 | 17 | 17 | 15 | 15 | 15 | 19 | 20 | 16 | 18 | 14 | 18 | 18 | 18 |
| LIARWHD | 500 | 0 | 16 | 35 | 20 | 18 | 15 | 266 | 17 | 18 | 19 | 17 | 15 | 15 | 15 | 24 | 19 | 18 | 16 | 17 | 16 | 16 | 16 |
| LIARWHD | 1000 | 0 | 19 | 50 | 20 | 18 | 15 | 347 | 18 | 21 | 19 | 18 | 19 | 19 | 19 | 23 | 24 | 18 | 19 | 16 | 19 | 19 | 19 |
| LIARWHD | 5000 | 0 | 33 | 58 | 19 | 18 | 17 | 680 | 18 | ( 22) | 20 | 18 | 19 | 19 | 19 | 34 | 47 | 18 | 33 | ( 19) | 33 | 33 | 33 |
| LIARWHD | 10000 | 0 | ( 23) | 54 | 19 | 17 | 17 | 929 | 18 | ( 47) | 36 | 18 | 19 | 19 | 19 | 49 | 26 | 17 | ( 23) | ( 60) | ( 23) | ( 23) | ( 23) |

Number of gradient evaluations ( 10 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINVERSE | 19 | 0 | 15 | 46 | ( 300) | 16 | 13 | 14 | 14 | ( 9) | 15 | 12 | 18 | 18 | 18 | 14 | 14 | 24 | —I— | —I— | 27 | 11 | —I— |
| LINVERSE | 199 | 0 | 12 | 45 | —I— | 18 | 11 | 11 | 11 | 13 | 12 | 57 | 23 | 27 | 24 | 15 | 21 | 11 | —I— | —I— | 15 | 15 | —I— |
| LINVERSE | 999 | 0 | 24 | ( 84) | 116 | 37 | 16 | 20 | 21 | 19 | 24 | 49 | 35 | 25 | 27 | 24 | 37 | 13 | —I— | —S— | 42 | 25 | 553 |
| LINVERSE | 1999 | 0 | 28 | —S— | 675 | —T— | ( 12) | 18 | 13 | 23 | 28 | 78 | 109 | 34 | 38 | 25 | 43 | 19 | —I— | —S— | 41 | 22 | —I— |
| LMINSURF | 16 | 0 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 24 | 7 | 7 | 7 |
| LMINSURF | 49 | 0 | 19 | 16 | 11 | 10 | 14 | 11 | 10 | 10 | 11 | 11 | 11 | 11 | 13 | 16 | 28 | 10 | 17 | 111 | 17 | 16 | 18 |
| LMINSURF | 64 | 0 | 18 | 25 | 11 | 9 | 17 | 12 | 18 | 19 | 11 | 11 | 11 | 11 | 15 | 17 | 18 | 9 | 21 | 257 | 22 | 21 | —I— |
| LMINSURF | 121 | 0 | 43 | 44 | 11 | 10 | 39 | 21 | 34 | 44 | 11 | 11 | 11 | 11 | 20 | 39 | 37 | 11 | 43 | 565 | 43 | 43 | 42 |
| LMINSURF | 961 | 0 | 185 | 206 | 18 | 17 | 481 | 104 | 183 | 185 | 185 | 18 | 18 | 18 | 34 | 209 | 215 | 19 | 212 | —I— | 254 | 220 | 204 |
| LMINSURF | 1024 | 0 | 218 | 300 | 18 | 20 | 424 | 123 | 243 | 210 | 220 | 18 | 18 | 18 | 51 | 261 | 218 | 21 | 223 | —I— | 229 | 224 | —I— |
| LMINSURF | 5625 | 0 | —I— | —I— | 32 | —T— | —I— | 431 | —I— | —I— | —I— | 32 | 32 | 32 | 333 | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| LMINSURF | 10000 | 0 | —I— | —I— | 31 | —T— | —I— | —I— | —I— | —I— | —I— | 31 | 31 | 31 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —I— |
| LMINSURF | 15625 | 0 | —T— | —T— | 36 | —T— | —I— | —I— | —T— | —T— | —T— | 36 | 36 | 36 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| LSQFIT | 2 | 0 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| LUBRIF | 151 | 100 | —F— | —I— | —I— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —I— | —F— | —F— | —F— | —I— | —I— | —I— | —F— | —I— |
| LUBRIF | 751 | 500 | —T— | —T— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| MANCINO | 10 | 0 | 8 | —S— | 6 | 6 | 5 | 372 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| MANCINO | 20 | 0 | 10 | —S— | 8 | 8 | 8 | —I— | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 |
| MANCINO | 30 | 0 | 11 | —S— | 9 | 9 | 9 | —I— | 12 | 11 | 11 | 11 | 9 | 9 | 9 | 11 | 13 | 13 | 11 | 11 | 11 | 11 | 11 |
| MANCINO | 50 | 0 | 13 | —S— | 11 | 11 | 10 | —I— | 13 | 13 | 13 | 13 | 12 | 12 | 12 | 13 | 15 | 14 | 13 | 13 | 12 | 12 | 12 |
| MANNE | 300 | 200 | 7 | 14 | —I— | 12 | 10 | 13 | 17 | 14 | 7 | 21 | 9 | 548 | 7 | 9 | 8 | 8 | 79 | 79 | 8 | 8 | 8 |
| MANNE | 1095 | 730 | —S— | 131 | —S— | 81 | 13 | 10 | —S— | 21 | —S— | —T— | 13 | —E— | 10 | 13 | 14 | 9 | 38 | 38 | 12 | 12 | —S— |
| MARATOS | 2 | 1 | 8 | 10 | 8 | 8 | 8 | 7 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 9 | 16 | 9 | 9 | 9 |
| MARATOSB | 2 | 0 | —I— | —I— | —I— | —I— | —I— | 306 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| MATRIX2 | 6 | 2 | 11 | 11 | 11 | 11 | 11 | 15 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 13 | 23 | 13 | 12 | 12 |
| MAXLIKA | 8 | 0 | ( 10) | 35 | 42 | 22 | 24 | 16 | ( 8) | 21 | 21 | 22 | 21 | ( 9) | 21 | ( 10) | ( 9) | ( 7) | —I— | —S— | 321 | 127 | 426 |
| MCCORMCK | 10 | 0 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 7 | 21 | 7 | 7 | 7 |
| MCCORMCK | 50 | 0 | 5 | 7 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 5 | 7 | 22 | 7 | 7 | 7 |
| MCCORMCK | 100 | 0 | 5 | 7 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 7 | 5 | 7 | 21 | 7 | 7 | 7 |
| MCCORMCK | 500 | 0 | 5 | 7 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 8 | 5 | 7 | 25 | 7 | 7 | 7 |
| MCCORMCK | 1000 | 0 | 5 | 7 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 9 | 5 | 7 | 23 | 7 | 7 | 7 |
| MCCORMCK | 5000 | 0 | 5 | 6 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 10 | 5 | 7 | 25 | 7 | 7 | 7 |
| MCCORMCK | 10000 | 0 | 5 | 6 | 5 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 10 | 5 | 7 | 24 | 7 | 7 | 7 |
| MDHOLE | 2 | 0 | 54 | 54 | 55 | 52 | 53 | 160 | 54 | 54 | 54 | 58 | 57 | 49 | 57 | 54 | 48 | 52 | 57 | 50 | 52 | 52 | 52 |
| METHANB8 | 31 | 31 | —I— | —E— | 9 | 9 | 9 | 9 | —F— | —F— | 55 | 12 | 9 | 9 | —F— | —I— | —I— | —S— | —S— | —F— | —I— | —S— | —S— |
| METHANL8 | 31 | 31 | —F— | —E— | 490 | 177 | 76 | —E— | —F— | —F— | —F— | 124 | 158 | 66 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| MEXHAT | 2 | 0 | 20 | 20 | 20 | 20 | 27 | —I— | 19 | 20 | 20 | 19 | 20 | 20 | 20 | 20 | 19 | 19 | 26 | 481 | 20 | 22 | 20 |
| MEYER3 | 3 | 0 | 407 | —S— | —I— | —I— | 394 | —I— | —S— | 407 | 407 | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | 501 | —S— | —I— |
| MINPERM | 5 | 5 | 7 | 7 | 7 | 7 | 7 | 9 | 7 | 13 | 7 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| MINPERM | 13 | 10 | 14 | 14 | 29 | 13 | 8 | 8 | 10 | 15 | 13 | 12 | 15 | 15 | 17 | 14 | 14 | 12 | 25 | —I— | 24 | 15 | 15 |
| MINPERM | 27 | 19 | 17 | 17 | 32 | 21 | 10 | 10 | 11 | 15 | 16 | 14 | 31 | 36 | 55 | 17 | 16 | 17 | 29 | —I— | 18 | 16 | 16 |
| MINPERM | 51 | 36 | 19 | 19 | 80 | 23 | 11 | 10 | 12 | 18 | 21 | 35 | 25 | 67 | 41 | 19 | 19 | 19 | 38 | —I— | 22 | 18 | 18 |
| MINPERM | 93 | 69 | 18 | 18 | 251 | 24 | 10 | 11 | 15 | 23 | 27 | 127 | 41 | 101 | 57 | 18 | 18 | 20 | 86 | —I— | 17 | 23 | 23 |
| MINPERM | 169 | 134 | 92 | 92 | —I— | 75 | 16 | 15 | 17 | 27 | 30 | 255 | 247 | 359 | 131 | 88 | 30 | 79 | 539 | —T— | 25 | 28 | 27 |
| MINPERM | 311 | 263 | 51 | 51 | —I— | 46 | 15 | 14 | 18 | 22 | 34 | 329 | 128 | 469 | 302 | 56 | 49 | 42 | 127 | —T— | 42 | 48 | 48 |
| MINPERM | 583 | 520 | 308 | 308 | —T— | —T— | 17 | 18 | 21 | 22 | 27 | —T— | —T— | —I— | 367 | 280 | 34 | 44 | —I— | —T— | 37 | 36 | 39 |
| MINPERM | 1113 | 1033 | 45 | 45 | —T— | —T— | 19 | 17 | 22 | 26 | 26 | —T— | —T— | —T— | 39 | 63 | 76 | 44 | 92 | —I— | 77 | 53 | 63 |
| MINSURF | 64 | 0 | 9 | 10 | 8 | 2 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 10 | 9 | 4 | 9 | 42 | 9 | 9 | 9 |
| MISTAKE | 9 | 13 | 29 | 29 | 98 | 24 | 24 | 19 | 31 | 34 | 50 | 33 | 30 | 31 | 21 | 28 | 32 | 26 | 59 | —I— | 33 | 37 | 37 |
| MSQRTA | 4 | 0 | 15 | 15 | 13 | 12 | 15 | 16 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 18 | 15 | 15 | 14 |
| MSQRTA | 49 | 0 | 15 | —I— | 23 | 19 | 15 | 16 | 15 | 15 | 17 | 17 | 16 | 19 | 20 | 15 | 16 | 15 | 19 | —I— | 15 | 19 | 16 |
| MSQRTA | 100 | 0 | 16 | 20 | 58 | 18 | 17 | 20 | 18 | 17 | 17 | 20 | 33 | 26 | 40 | 21 | 17 | 17 | 34 | —I— | 14 | 13 | 15 |
| MSQRTA | 529 | 0 | 35 | 35 | —T— | —T— | 30 | 50 | 33 | 34 | 38 | —T— | —T— | —T— | —T— | 60 | 47 | 32 | 194 | —I— | 37 | 34 | 65 |
| MSQRTA | 1024 | 0 | 36 | 36 | —T— | —T— | —T— | 77 | 34 | 33 | 29 | —T— | —T— | —T— | —T— | —T— | 34 | —T— | —T— | —T— | 31 | 33 | —T— |
| MSQRTB | 9 | 0 | 12 | 14 | 11 | 12 | 11 | 11 | 12 | 11 | 11 | 12 | 10 | 12 | 12 | 13 | 10 | 12 | 17 | —I— | 9 | 9 | 11 |
| MSQRTB | 49 | 0 | 17 | 35 | 0 | 17 | 15 | 15 | 15 | 15 | 19 | 17 | 20 | 22 | 24 | ( 377) | 14 | 15 | 20 | —I— | 14 | 16 | 16 |
| MSQRTB | 100 | 0 | 20 | 27 | 0 | 21 | 18 | 22 | 20 | 20 | 19 | 19 | 44 | 30 | 51 | 21 | 17 | 22 | 29 | —I— | 16 | 16 | 20 |
| MSQRTB | 529 | 0 | 37 | 37 | —T— | —T— | 35 | 47 | 36 | 31 | 31 | 38 | —T— | —T— | —T— | 68 | 43 | 36 | 135 | —I— | 34 | 31 | 66 |
| MSQRTB | 1024 | 0 | 27 | 27 | —T— | —T— | 26 | 59 | 26 | 28 | 28 | —T— | —T— | —T— | —T— | 52 | 28 | 26 | —T— | —T— | 28 | 26 | —T— |

Number of gradient evaluations ( 11 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MWRIGHT | 5 | 3 | ( 19) | 24 | ( 20) | ( 18) | ( 20) | ( 38) | ( 23) | ( 20) | ( 19) | ( 21) | ( 19) | ( 19) | ( 20) | ( 19) | ( 18) | ( 18) | ( 491) | ( 582) | ( 24) | ( 24) | ( 27) |
| NGONE | 8 | 8 | 16 | 23 | 62 | 13 | 15 | 18 | 18 | 17 | 16 | 16 | 13 | 16 | 18 | 19 | 17 | 19 | 117 | —I— | 22 | 23 | 23 |
| NGONE | 12 | 19 | 35 | 48 | 209 | 31 | —E— | 35 | 32 | 37 | 33 | 29 | 31 | 31 | 33 | 33 | 37 | 36 | 77 | —I— | 37 | 33 | 31 |
| NGONE | 50 | 323 | —I— | —I— | —I— | —I— | ( 670) | —I— | —I— | ( 171) | —I— | —I— | ( 70) | 291 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | ( 799) | —I— |
| NGONE | 100 | 1273 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —T— | 816 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| NGONE | 500 | 31373 | —T— | —T— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —M— | —M— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NLMSURF | 16 | 0 | 11 | 11 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 50 | 11 | 11 | 10 |
| NLMSURF | 49 | 0 | 38 | 61 | 20 | 11 | 39 | 22 | 22 | 29 | 20 | 20 | 20 | 20 | 29 | 32 | 67 | 11 | 34 | 686 | 47 | 47 | 77 |
| NLMSURF | 64 | 0 | 40 | 62 | 13 | 12 | 53 | 34 | 42 | 39 | 13 | 13 | 13 | 13 | 40 | 42 | 58 | 12 | 43 | —I— | 43 | 43 | 88 |
| NLMSURF | 121 | 0 | 89 | 114 | 15 | 12 | 133 | 58 | 102 | 107 | 15 | 15 | 15 | 15 | 98 | 104 | 163 | 12 | 102 | —I— | 113 | 113 | 262 |
| NLMSURF | 961 | 0 | 534 | 648 | 17 | 15 | —I— | 338 | 604 | 545 | 556 | 17 | 17 | 17 | 129 | 660 | 551 | 16 | 599 | —I— | 657 | 599 | 757 |
| NLMSURF | 1024 | 0 | 715 | 634 | 17 | 16 | —I— | 371 | 601 | 658 | 717 | 17 | 17 | 17 | 156 | 695 | 608 | 16 | 548 | —I— | 639 | 576 | 679 |
| NLMSURF | 5625 | 0 | —I— | —I— | 20 | 22 | —I— | —I— | —I— | —I— | —I— | 20 | 20 | 20 | —I— | —I— | —I— | 21 | —I— | —I— | —I— | —I— | —I— |
| NLMSURF | 10000 | 0 | —I— | —I— | 20 | —T— | —I— | —I— | —I— | —I— | —I— | 20 | 20 | 20 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —E— |
| NLMSURF | 15625 | 0 | —T— | —T— | 23 | —T— | —I— | —I— | —T— | —T— | —T— | 23 | 23 | 23 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONDIA | 10 | 0 | 26 | 21 | 22 | 21 | 18 | 34 | 25 | 24 | 17 | 35 | 23 | 26 | 19 | 24 | 27 | 18 | 24 | 24 | 14 | 14 | 14 |
| NONDIA | 20 | 0 | 32 | 26 | 27 | 24 | 22 | 47 | 23 | 32 | 29 | 34 | 27 | 26 | 28 | 27 | 34 | 27 | 29 | 29 | 19 | 19 | 19 |
| NONDIA | 30 | 0 | 53 | 38 | 38 | 36 | 30 | 83 | 94 | 35 | 61 | 42 | 35 | 33 | 31 | 67 | 45 | 38 | 38 | 38 | 31 | 31 | 31 |
| NONDIA | 50 | 0 | 64 | 38 | 39 | 40 | 28 | 105 | 194 | 40 | 121 | 120 | 32 | 46 | 40 | 46 | 63 | 42 | 45 | 45 | 61 | 61 | 52 |
| NONDIA | 90 | 0 | 91 | 57 | 45 | 44 | 28 | 139 | 67 | 128 | 131 | 59 | 46 | 46 | 44 | 151 | 62 | 47 | 98 | 98 | 163 | 163 | 161 |
| NONDIA | 100 | 0 | 124 | 48 | 48 | 46 | 30 | 146 | 116 | 49 | 62 | 192 | 46 | 47 | 45 | 86 | 60 | 41 | 94 | 94 | 124 | 124 | 121 |
| NONDIA | 500 | 0 | 298 | 55 | 46 | 53 | 37 | 320 | 153 | 228 | 231 | 128 | 44 | 44 | 46 | 93 | 55 | 46 | 42 | 42 | 288 | 288 | 273 |
| NONDIA | 1000 | 0 | 236 | 42 | 45 | 52 | 38 | 451 | 221 | 212 | 267 | 255 | 41 | 41 | 47 | 71 | 57 | 49 | 72 | 72 | 69 | 69 | 67 |
| NONDIA | 5000 | 0 | 101 | ( 79) | 42 | —T— | 39 | —I— | 141 | 174 | 73 | 167 | 42 | 42 | 42 | 146 | 68 | —T— | 89 | 89 | 141 | 141 | 100 |
| NONDIA | 10000 | 0 | 131 | 108 | 47 | —T— | 39 | —I— | 272 | 72 | 62 | 243 | 45 | 45 | 42 | 123 | 58 | —T— | 88 | 88 | 89 | 89 | 82 |
| NONDQUAR | 100 | 0 | 16 | 16 | 16 | 16 | 54 | 18 | 84 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| NONDQUAR | 500 | 0 | 17 | 17 | 17 | 17 | 65 | 18 | 91 | 17 | 17 | 18 | 17 | 17 | 17 | 17 | 19 | 17 | 17 | 17 | 17 | 17 | 17 |
| NONDQUAR | 1000 | 0 | 18 | 18 | 18 | 18 | 75 | 19 | 139 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 18 |
| NONDQUAR | 5000 | 0 | 19 | 19 | 19 | 19 | 68 | 20 | 108 | 19 | 19 | 23 | 19 | 19 | 19 | 19 | 22 | 19 | 19 | 19 | 19 | 19 | 19 |
| NONMSQRT | 9 | 0 | 101 | 182 | —I— | —I— | ( 79) | —I— | ( 90) | ( 111) | 101 | ( 93) | ( 362) | 92 | 98 | 94 | ( 113) | ( 81) | —I— | —S— | 103 | 81 | —I— |
| NONMSQRT | 49 | 0 | —I— | —I— | —I— | —I— | ( 193) | —I— | ( 421) | —I— | ( 988) | 238 | —I— | 253 | ( 625) | —I— | —I— | —T— | —I— | —S— | —I— | —I— | —I— |
| NONMSQRT | 100 | 0 | —T— | —T— | —I— | —I— | 296 | —I— | ( 674) | —T— | —I— | —S— | —T— | —S— | —I— | —T— | —T— | —T— | —I— | —S— | —T— | —T— | —I— |
| NONMSQRT | 529 | 0 | —T— | —T— | —I— | —I— | —T— | —I— | —T— | —T— | —T— | —S— | —T— | —S— | —T— | —T— | —T— | —T— | —E— | —I— | —T— | —T— | —T— |
| NONMSQRT | 1024 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONSCOMP | 25 | 0 | 9 | 10 | 9 | 9 | 9 | 31 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 50 | 0 | 9 | 10 | 9 | 9 | 9 | 30 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 11 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 100 | 0 | 9 | 10 | 9 | 9 | 9 | 30 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 11 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 500 | 0 | 9 | 10 | 9 | 9 | 9 | 30 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 12 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 1000 | 0 | 9 | 10 | 9 | 9 | 9 | 31 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 13 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 5000 | 0 | 9 | 10 | 9 | 9 | 9 | 32 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 14 | 9 | 6 | 6 | 9 | 9 | 9 |
| NONSCOMP | 10000 | 0 | 9 | 10 | 9 | 9 | 9 | 32 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 14 | 9 | 6 | 6 | 9 | 9 | 9 |
| NYSTROM5 | 18 | 20 | —F— | —F— | —F— | 33 | 15 | 36 | 17 | 25 | —F— | 35 | 38 | —F— | 50 | —F— | —F— | 18 | 77 | —F— | 41 | —F— | —F— |
| OBSTCLAE | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| OBSTCLAE | 100 | 0 | 4 | 5 | 13 | 3 | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 4 | 6 | 5 | 6 | 24 | 6 | 6 | 6 |
| OBSTCLAE | 529 | 0 | 4 | 8 | 85 | 3 | 4 | 6 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 8 | 5 | 5 | 125 | 5 | 5 | 5 |
| OBSTCLAE | 1024 | 0 | 4 | 7 | 164 | 4 | 4 | 7 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 8 | 5 | 5 | 239 | 5 | 5 | 5 |
| OBSTCLAE | 5625 | 0 | 6 | 9 | 834 | —T— | 6 | 6 | 5 | 6 | 6 | 3 | 3 | 3 | 3 | 6 | 10 | 6 | 7 | —I— | 7 | 7 | 7 |
| OBSTCLAE | 10000 | 0 | 6 | 6 | —T— | —T— | 6 | 7 | 6 | 6 | —T— | —T— | —T— | —T— | —T— | 6 | 11 | 5 | 8 | —T— | 8 | 8 | 8 |
| OBSTCLAE | 15625 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| OBSTCLAL | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OBSTCLAL | 100 | 0 | 5 | 6 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 6 | 27 | 6 | 6 | 6 |
| OBSTCLAL | 529 | 0 | 8 | 10 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 8 | 8 | 8 | 9 | 105 | 9 | 9 | 22 |
| OBSTCLAL | 1024 | 0 | 9 | 11 | 8 | 8 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 9 | 9 | 9 | 10 | 199 | 10 | 10 | 10 |
| OBSTCLAL | 5625 | 0 | 17 | 18 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | —I— | 17 | 17 | 17 |
| OBSTCLAL | 10000 | 0 | 20 | 22 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | —I— | 21 | 21 | 35 |
| OBSTCLAL | 15625 | 0 | 25 | 27 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 26 | —T— | 26 | 26 | 30 |
| OBSTCLBL | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| OBSTCLBL | 100 | 0 | 3 | 4 | 4 | 3 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 20 | 4 | 4 | 4 |
| OBSTCLBL | 529 | 0 | 6 | 7 | 19 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 8 | 7 | 7 | 190 | 7 | 7 | 7 |

Number of gradient evaluations ( 12 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBSTCLBL | 1024 | 0 | 8 | 9 | 44 | 6 | 7 | 8 | 8 | 8 | 8 | 6 | 6 | 6 | 7 | 7 | 9 | 8 | 8 | 426 | 8 | 8 | 8 |
| OBSTCLBL | 5625 | 0 | 13 | —S— | 169 | 13 | 13 | 14 | 13 | 13 | 13 | 12 | 12 | 12 | 13 | 14 | 14 | 14 | 14 | —I— | 14 | 14 | 56 |
| OBSTCLBL | 10000 | 0 | 17 | —S— | 350 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 26 | 16 | 17 | 16 | 16 | —T— | 16 | 20 | 40 |
| OBSTCLBL | 15625 | 0 | 19 | —S— | —T— | 18 | 19 | 19 | 19 | 19 | 19 | 18 | 18 | 18 | —T— | 19 | 20 | 19 | 19 | —T— | 19 | 23 | 62 |
| OBSTCLBM | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| OBSTCLBM | 100 | 0 | 2 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 17 | 3 | 3 | 3 |
| OBSTCLBM | 529 | 0 | 4 | 6 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 5 | 4 | 5 | 5 | 93 | 5 | 5 | 5 |
| OBSTCLBM | 1024 | 0 | 5 | 6 | 8 | 4 | 5 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 328 | 5 | 5 | 5 |
| OBSTCLBM | 5625 | 0 | 6 | 7 | 28 | 5 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 7 | 6 | 6 | 6 | —I— | 6 | 6 | 6 |
| OBSTCLBM | 10000 | 0 | 5 | 7 | 50 | 5 | 5 | 6 | 6 | 5 | 6 | 5 | 5 | 5 | —T— | 7 | 7 | 6 | 7 | —T— | 7 | 7 | 8 |
| OBSTCLBM | 15625 | 0 | 6 | —T— | 92 | 6 | 6 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | —T— | 7 | 6 | 6 | 7 | —T— | 7 | 7 | 7 |
| OBSTCLBU | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| OBSTCLBU | 100 | 0 | 2 | 2 | 2 | 2 | 3 | 4 | 5 | 4 | 2 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 4 | 21 | 4 | 4 | 4 |
| OBSTCLBU | 529 | 0 | 7 | 9 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 229 | 7 | 7 | 7 |
| OBSTCLBU | 1024 | 0 | 8 | 9 | 10 | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 8 | 9 | 8 | 9 | 369 | 9 | 9 | 9 |
| OBSTCLBU | 5625 | 0 | 14 | 16 | 24 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 15 | 14 | 14 | —I— | 14 | 14 | 14 |
| OBSTCLBU | 10000 | 0 | 17 | 19 | 32 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 17 | 17 | —T— | 17 | 17 | 36 |
| OBSTCLBU | 15625 | 0 | 20 | 22 | 25 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 20 | 21 | —T— | 21 | 21 | 46 |
| OPTCNTRL | 32 | 20 | 24 | 19 | 46 | 29 | 26 | 401 | 34 | 34 | 25 | 24 | 26 | 26 | 26 | 24 | 29 | 24 | 24 | 29 | 24 | 24 | 24 |
| OPTMASS | 70 | 55 | —I— | 325 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| OPTMASS | 610 | 505 | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 1210 | 1005 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 3010 | 2505 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —E— | —I— | —I— | —I— | —I— |
| ORTHREGA | 133 | 64 | 115 | —S— | 133 | —I— | —S— | —I— | 90 | 106 | 137 | 116 | 65 | 97 | 153 | 116 | 121 | 97 | —I— | —I— | 209 | 144 | —I— |
| ORTHREGA | 517 | 256 | 152 | 253 | —T— | —I— | 141 | —I— | 105 | 163 | 159 | 145 | 84 | —T— | 316 | 152 | 146 | 116 | —I— | —I— | 230 | 184 | —I— |
| ORTHREGA | 2053 | 1024 | 177 | —S— | —M— | —I— | 240 | —I— | 127 | 176 | —S— | —T— | 114 | —E— | —T— | 189 | 183 | 125 | —I— | —I— | 251 | 226 | —I— |
| ORTHREGA | 8197 | 4096 | —S— | —S— | —M— | —T— | 182 | —I— | 156 | —S— | 226 | —E— | —T— | —E— | —T— | 215 | 237 | —T— | —I— | —I— | —S— | —S— | —T— |
| ORTHREGB | 27 | 6 | 83 | 266 | —I— | 62 | 10 | —I— | 333 | 72 | 62 | 221 | 87 | 135 | 111 | 88 | 140 | 117 | 135 | —I— | 97 | 72 | 173 |
| ORTHREGC | 25 | 10 | 36 | 67 | ( 68) | 27 | 23 | ( 240) | 47 | 37 | 34 | 35 | 23 | —I— | 37 | 33 | 36 | ( 34) | —I— | —I— | ( 40) | ( 66) | ( 54) |
| ORTHREGC | 105 | 50 | ( 72) | 134 | 65 | ( 321) | 31 | —I— | 44 | ( 49) | ( 66) | 54 | 33 | 41 | ( 94) | ( 59) | 34 | ( 43) | —I— | —I— | 67 | 67 | 178 |
| ORTHREGC | 505 | 250 | ( 50) | 107 | 239 | ( 155) | 29 | —I— | 39 | ( 56) | ( 51) | 45 | 29 | 54 | 39 | 41 | 39 | ( 41) | —I— | —I— | 49 | 76 | 273 |
| ORTHREGC | 1005 | 500 | 40 | —S— | 303 | ( 81) | 28 | —I— | 44 | 49 | 43 | 60 | 36 | 81 | 38 | 40 | 44 | ( 57) | —I— | —I— | ( 51) | ( 70) | ( 353) |
| ORTHREGC | 5005 | 2500 | 47 | —T— | —T— | —T— | 47 | —I— | 53 | 43 | 46 | 80 | 56 | —M— | 47 | 47 | 49 | —T— | —I— | —I— | 58 | 93 | —I— |
| ORTHREGC | 10005 | 5000 | 45 | —T— | —M— | —T— | 50 | —I— | 56 | 42 | —S— | —T— | 43 | —M— | —T— | 45 | 45 | —T— | —T— | —T— | 65 | 87 | —T— |
| ORTHREGD | 23 | 10 | 354 | —F— | 149 | 112 | 29 | —I— | 402 | 351 | 278 | 152 | 55 | 71 | 117 | 423 | 243 | 72 | 286 | 403 | 279 | 257 | 230 |
| ORTHREGD | 103 | 50 | 467 | —F— | 627 | 438 | 39 | —I— | 737 | 500 | 455 | 221 | 83 | —S— | 92 | —S— | —S— | 104 | 260 | —I— | 248 | 261 | 276 |
| ORTHREGD | 503 | 250 | 309 | —F— | —I— | —I— | 38 | —I— | —I— | 243 | 284 | 192 | 65 | 262 | 77 | —S— | —S— | 81 | 160 | —S— | 144 | —S— | —I— |
| ORTHREGD | 1003 | 500 | 225 | —F— | —I— | —I— | 44 | —I— | —I— | 260 | 223 | 266 | 87 | —S— | 59 | —S— | —S— | 77 | 120 | —S— | 128 | 139 | —I— |
| ORTHREGD | 5003 | 2500 | 144 | —F— | —T— | —T— | 48 | —I— | 364 | 132 | —S— | 556 | 110 | —T— | 41 | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —I— |
| ORTHREGD | 10003 | 5000 | 92 | —F— | —M— | —T— | 42 | —T— | —S— | 60 | 88 | —T— | —T— | —E— | —T— | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —T— |
| ORTHREGE | 36 | 20 | —S— | ( 142) | ( 150) | —I— | 42 | —I— | —S— | —S— | ( 198) | ( 84) | —I— | —I— | —I— | —S— | ( 106) | —S— | —I— | —I— | —I— | —S— | —I— |
| ORTHREGF | 80 | 25 | 51 | 234 | 91 | 31 | 27 | 84 | 58 | 53 | 48 | 29 | 34 | 34 | 42 | 49 | 50 | 38 | 69 | —I— | 42 | 54 | 55 |
| ORTHREGF | 152 | 49 | 54 | —I— | 59 | 31 | 21 | 49 | 71 | 80 | 55 | 31 | 38 | 42 | 38 | 53 | 60 | 35 | 236 | —I— | 79 | 103 | 74 |
| ORTHREGF | 305 | 100 | ( 61) | —I— | ( 106) | 36 | 27 | ( 160) | ( 77) | ( 70) | ( 72) | ( 63) | 32 | 54 | ( 51) | ( 88) | ( 64) | ( 39) | —I— | —I— | ( 46) | ( 63) | ( 58) |
| ORTHREGF | 680 | 225 | ( 127) | ( 232) | 110 | ( 39) | 32 | ( 185) | ( 109) | ( 105) | ( 76) | ( 74) | 36 | 63 | ( 46) | ( 106) | ( 158) | 38 | —I— | —I— | ( 84) | ( 76) | ( 215) |
| ORTHREGF | 1205 | 400 | —S— | —S— | ( 270) | ( 44) | 39 | ( 383) | ( 159) | ( 128) | ( 367) | ( 80) | 39 | 72 | 39 | ( 177) | ( 155) | ( 44) | —I— | —I— | ( 92) | ( 115) | ( 104) |
| OSBORNEA | 5 | 0 | 35 | —E— | 39 | 12 | 52 | —I— | 59 | 64 | 35 | 53 | 28 | 38 | 32 | 35 | 46 | 45 | 114 | —S— | 69 | 55 | 55 |
| OSBORNEB | 11 | 0 | 18 | 21 | 16 | 19 | 26 | —E— | 17 | 14 | 26 | 21 | 19 | 18 | 12 | 22 | ( 43) | 19 | 65 | —I— | 19 | 37 | 31 |
| PALMER1 | 4 | 0 | 27 | —S— | 305 | 27 | 27 | 210 | 30 | 26 | 27 | 35 | 27 | 27 | 34 | 28 | 35 | 26 | 33 | —S— | 42 | 29 | —S— |
| PALMER1A | 6 | 0 | 58 | 64 | 118 | —S— | 140 | —I— | —S— | 88 | 58 | 82 | 58 | 83 | 59 | 59 | 63 | 57 | 157 | —I— | 67 | 97 | 106 |
| PALMER1B | 4 | 0 | 36 | 40 | 192 | 36 | 35 | —I— | 36 | 41 | 36 | 33 | 34 | 34 | 32 | 36 | 35 | 34 | 61 | —S— | 42 | 55 | 55 |
| PALMER1C | 8 | 0 | 17 | 14 | 13 | 10 | 67 | —I— | 27 | —S— | 32 | 18 | 11 | 11 | 18 | 19 | 23 | 13 | 17 | 17 | 17 | 17 | 17 |
| PALMER1D | 7 | 0 | 15 | 9 | 13 | 10 | 48 | —I— | 14 | 15 | 14 | 18 | 9 | 9 | 17 | 16 | 17 | 11 | 15 | 15 | 15 | 15 | 15 |
| PALMER1E | 8 | 0 | 222 | 208 | —I— | 57 | 227 | —I— | 205 | 137 | 250 | 113 | 587 | 603 | 209 | 180 | 173 | 110 | —I— | —I— | 207 | 169 | 176 |
| PALMER2 | 4 | 0 | 19 | 43 | 95 | 49 | 24 | 123 | 27 | 21 | 19 | 39 | 19 | 19 | 19 | 19 | 23 | 27 | 106 | —S— | 29 | 21 | 25 |
| PALMER2A | 6 | 0 | 139 | 137 | 102 | 65 | 84 | 382 | 96 | 165 | 139 | 129 | 104 | 87 | 95 | 133 | 156 | 120 | 456 | —I— | 135 | 149 | 185 |
| PALMER2B | 4 | 0 | 76 | 76 | 117 | 27 | 30 | —I— | 63 | 81 | 76 | 55 | 76 | 76 | 76 | 19 | 19 | 26 | 72 | —S— | 74 | 83 | —S— |
| PALMER2C | 8 | 0 | 13 | —S— | 8 | 8 | 36 | —I— | 28 | 18 | 12 | 15 | 8 | 8 | 15 | 35 | 19 | 10 | 13 | 13 | 13 | 13 | 13 |
| PALMER2E | 8 | 0 | 101 | 110 | 256 | 62 | 138 | —I— | 212 | 245 | 282 | 157 | 277 | 237 | 269 | 144 | 126 | 121 | —I— | —I— | 157 | 217 | 167 |

Number of gradient evaluations ( 13 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PALMER3 | 4 | 0 | 33 | 45 | 47 | 37 | ( 28) | 73 | ( 36) | 35 | 33 | ( 28) | 31 | 39 | 49 | 50 | 16 | 37 | ( 58) | —I— | ( 39) | ( 52) | 90 |
| PALMER3A | 6 | 0 | 126 | 133 | 121 | 89 | 129 | —I— | 102 | 149 | 126 | 149 | 105 | 84 | 87 | 138 | 153 | 118 | —I— | —S— | 158 | 148 | 158 |
| PALMER3B | 4 | 0 | 56 | 56 | 90 | 26 | 24 | 87 | 34 | 77 | 56 | 31 | 44 | 59 | 26 | 19 | 35 | 23 | 39 | —S— | 25 | 20 | 20 |
| PALMER3C | 8 | 0 | 13 | 18 | 9 | 9 | 14 | —I— | 20 | 19 | 12 | 11 | 8 | 8 | 13 | 15 | 13 | 10 | 13 | 13 | 13 | 13 | 13 |
| PALMER3E | 8 | 0 | 68 | ( 93) | 32 | 35 | 109 | —I— | 164 | 139 | 207 | 71 | 43 | 35 | 182 | 78 | 61 | 93 | —I— | —I— | 119 | 125 | 138 |
| PALMER4 | 4 | 0 | 35 | 39 | ( 37) | 40 | ( 28) | 80 | ( 32) | 40 | 35 | ( 28) | 37 | 53 | 37 | 36 | 21 | 39 | —I— | —S— | ( 51) | 37 | —S— |
| PALMER4A | 6 | 0 | 42 | 64 | 124 | 65 | 62 | —I— | 54 | 68 | 42 | 89 | 81 | 49 | 68 | 60 | 57 | 60 | 92 | —I— | 67 | 94 | 91 |
| PALMER4B | 4 | 0 | 31 | 31 | 44 | 26 | 31 | 89 | 32 | 73 | 31 | 30 | 53 | 35 | 35 | —S— | 31 | 24 | 23 | —I— | 31 | 23 | 23 |
| PALMER4C | 8 | 0 | 40 | 33 | 9 | 9 | 43 | —I— | 21 | 17 | 28 | 16 | 8 | 8 | 17 | 22 | 31 | 11 | 40 | 40 | 40 | 40 | 40 |
| PALMER4E | 8 | 0 | 47 | 59 | 26 | 29 | 75 | —I— | 82 | 65 | 90 | 62 | 52 | 20 | 131 | 50 | 98 | 49 | —I— | —I— | 58 | 155 | 203 |
| PENALTY1 | 4 | 0 | 32 | 42 | 32 | 31 | 25 | 63 | 29 | 32 | 32 | 32 | 32 | 32 | 32 | 24 | 29 | 36 | 30 | 39 | 30 | 30 | 30 |
| PENALTY1 | 10 | 0 | 35 | 56 | 34 | 38 | 34 | 254 | 43 | 42 | 34 | 34 | 34 | 34 | 34 | 36 | 39 | 37 | 42 | 28 | 42 | 42 | 42 |
| PENALTY1 | 50 | 0 | 59 | 155 | 44 | 42 | 45 | —I— | 47 | 53 | 53 | 44 | 45 | 44 | 43 | 44 | 48 | 44 | 53 | 74 | 53 | 53 | 79 |
| PENALTY1 | 100 | 0 | 48 | 107 | 42 | 44 | 44 | —I— | 46 | 53 | 43 | 42 | 42 | 42 | 42 | 50 | 51 | 41 | 45 | 85 | 45 | 45 | 48 |
| PENALTY1 | 500 | 0 | 51 | 102 | 48 | 49 | 51 | —I— | 50 | 73 | 53 | 48 | 48 | 48 | 48 | 57 | 54 | 48 | 55 | 96 | 55 | 55 | 55 |
| PENALTY1 | 1000 | 0 | 57 | 73 | —T— | —T— | 51 | —I— | 48 | 47 | 56 | —T— | —T— | —T— | —T— | 51 | 54 | 50 | 57 | 66 | 57 | 57 | 69 |
| PENALTY2 | 4 | 0 | 9 | 59 | 47 | 47 | 7 | 7 | 7 | 7 | 9 | 42 | 36 | 36 | 9 | 9 | 11 | 11 | 8 | 6 | 8 | 8 | 8 |
| PENALTY2 | 10 | 0 | 84 | 234 | 32 | 66 | 14 | 107 | 53 | 16 | 89 | 91 | 53 | 53 | 88 | 85 | 93 | 40 | 82 | 23 | 82 | 82 | 82 |
| PENALTY2 | 50 | 0 | 36 | 43 | 29 | 28 | 32 | 77 | 32 | 59 | 51 | 41 | 31 | 30 | 33 | 47 | 32 | 33 | 42 | 73 | 42 | 42 | 41 |
| PENALTY2 | 100 | 0 | 20 | 23 | 20 | 20 | 19 | 165 | 21 | 21 | 21 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | 73 | 20 | 21 | 20 |
| PENALTY3 | 50 | 0 | 21 | —S— | —S— | —S— | 19 | —I— | —S— | 22 | —S— | 21 | 22 | 26 | —S— | ( 324) | —S— | 22 | —I— | —S— | —S— | 75 | —S— |
| PENALTY3 | 100 | 0 | —S— | —S— | —S— | —S— | 22 | —I— | 24 | —S— | 22 | 28 | —S— | 28 | —S— | —I— | 26 | —S— | —I— | —T— | —S— | 93 | —S— |
| PENTAGON | 6 | 15 | 11 | 69 | 70 | 11 | 9 | 16 | 11 | 10 | 14 | 12 | 9 | 7 | 8 | 11 | 11 | 11 | 31 | —I— | 33 | 29 | 29 |
| POWELLBS | 2 | 0 | 42 | 42 | 42 | 38 | 42 | 115 | 40 | 42 | 42 | 46 | 40 | 39 | 42 | 42 | 42 | 42 | 42 | 42 | 42 | 43 | —S— |
| POWELLSG | 4 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 8 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 16 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 20 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 36 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 40 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 60 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 80 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 100 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 500 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 1000 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 5000 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSG | 10000 | 0 | 16 | 18 | 16 | 16 | 16 | 32 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 19 | 16 | 16 | 16 | 16 | 16 | 16 |
| POWELLSQ | 2 | 0 | 5 | 18 | 5 | 5 | 5 | 72 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 18 | 5 | 12 | 13 | 17 | 17 | 17 |
| POWER | 10 | 0 | 17 | 18 | 17 | 17 | 17 | 37 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 14 | 17 | 17 | 17 |
| POWER | 20 | 0 | 18 | 20 | 19 | 19 | 19 | 74 | 19 | 19 | 18 | 18 | 19 | 19 | 19 | 18 | 19 | 18 | 18 | 15 | 18 | 18 | 18 |
| POWER | 30 | 0 | 19 | 21 | 20 | 20 | 20 | 120 | 20 | 20 | 19 | 19 | 20 | 20 | 20 | 19 | 20 | 19 | 19 | 16 | 19 | 19 | 19 |
| POWER | 50 | 0 | 20 | 22 | 21 | 21 | 21 | 236 | 21 | 21 | 21 | 20 | 21 | 21 | 21 | 20 | 21 | 20 | 21 | 17 | 21 | 21 | 21 |
| POWER | 75 | 0 | 21 | 23 | 22 | 22 | 23 | 414 | 22 | 22 | 21 | 21 | 22 | 22 | 22 | 21 | 23 | 21 | 22 | 18 | 22 | 22 | 22 |
| POWER | 100 | 0 | 23 | 24 | 23 | 23 | 23 | 624 | 23 | 23 | 22 | 22 | 23 | 23 | 23 | 23 | 24 | 22 | 23 | 19 | 23 | 23 | 23 |
| POWER | 500 | 0 | 27 | 28 | 28 | 28 | 27 | —I— | 27 | 27 | 27 | 26 | 27 | 27 | 27 | 27 | 29 | 27 | 26 | 22 | 26 | 26 | 26 |
| POWER | 1000 | 0 | 28 | 29 | —T— | —T— | 29 | —I— | 28 | 28 | 28 | —T— | —T— | —T— | —T— | 28 | 31 | 28 | 28 | 23 | 28 | 28 | 28 |
| PROBPENL | 10 | 0 | 89 | 89 | ( 3) | —I— | ( 40) | ( 7) | ( 3) | ( 3) | ( 19) | ( 3) | ( 3) | ( 3) | ( 48) | 89 | ( 3) | ( 35) | ( 4) | ( 4) | ( 3) | ( 3) | ( 3) |
| PROBPENL | 50 | 0 | 2 | 2 | 2 | 2 | 2 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 3 | 3 | 3 |
| PROBPENL | 100 | 0 | 2 | 2 | 2 | 2 | 2 | 8 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 4 | 4 | 3 | 3 | 3 |
| PROBPENL | 500 | 0 | 2 | —S— | 2 | 2 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 4 | 4 | 3 | 3 | 3 |
| PRODPL0 | 60 | 29 | —S— | —S— | —I— | 942 | 33 | 121 | 31 | 34 | —S— | 36 | 44 | 51 | 38 | 35 | —S— | —S— | 41 | 681 | —S— | 38 | 75 |
| PRODPL1 | 60 | 29 | 60 | 60 | —I— | —I— | 57 | 281 | 58 | 65 | 57 | 62 | 65 | 49 | 67 | 64 | 64 | 56 | 64 | —I— | 69 | 62 | 142 |
| PSPDOC | 4 | 0 | 7 | 7 | 7 | 3 | 7 | 6 | 6 | 7 | 7 | 6 | 7 | 7 | 7 | 8 | 8 | 3 | 3 | 3 | 3 | 3 | 7 |
| QUARTC | 25 | 0 | 22 | 25 | 22 | 22 | 22 | 928 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 22 | 23 | 22 | 22 | 22 | 22 | 22 | 22 |
| QUARTC | 100 | 0 | 27 | 35 | 27 | 27 | 27 | —I— | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 29 | 27 | 27 | 27 | 27 | 27 | 27 |
| QUARTC | 500 | 0 | 34 | 42 | 33 | 33 | 34 | —I— | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 37 | 34 | 34 | 34 | 34 | 34 | 34 |
| QUARTC | 1000 | 0 | 36 | 46 | 36 | 36 | 36 | —I— | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 36 | 40 | 36 | 36 | 36 | 36 | 36 | 36 |
| QUARTC | 5000 | 0 | 43 | 55 | 42 | 42 | 43 | —I— | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 48 | 43 | 43 | 43 | 43 | 43 | 43 |
| QUARTC | 10000 | 0 | 46 | 58 | ( 45) | ( 45) | 46 | —I— | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 46 | 51 | 46 | 46 | 46 | 46 | 46 | 46 |

Number of gradient evaluations ( 14 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| READING1 | 202 | 100 | 691 | —F— | —I— | —I— | 260 | 217 | —I— | —I— | 598 | 323 | —I— | 343 | —I— | 677 | 598 | 294 | —I— | —I— | 717 | —I— | —I— |
| READING2 | 303 | 200 | 23 | 375 | —I— | —I— | —T— | 47 | 19 | 18 | 23 | 36 | 41 | 36 | 15 | 20 | 31 | 12 | 23 | 23 | 23 | 23 | 23 |
| READING3 | 202 | 101 | —I— | —S— | —I— | —I— | 571 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 450 | —I— | —I— | —I— | —I— | —I— |
| RECIPE | 3 | 0 | 17 | 17 | 17 | 17 | 17 | 50 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 17 | 37 | —I— | 22 | 14 | 14 |
| ROSENBR | 2 | 0 | 10 | 10 | 10 | 10 | 9 | 35 | 14 | 10 | 10 | 14 | 10 | 10 | 10 | 10 | 11 | 11 | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) |
| S277-280 | 4 | 4 | 17 | 17 | 23 | 13 | 11 | 49 | 10 | 9 | 17 | 13 | 11 | 12 | 19 | 13 | 15 | 18 | 17 | 17 | 17 | 17 | 17 |
| S277-280 | 6 | 6 | 21 | 21 | —I— | 157 | 12 | 53 | 16 | 14 | 11 | 13 | 13 | 15 | 15 | 15 | 18 | 17 | 21 | 21 | 21 | 21 | 21 |
| S277-280 | 8 | 8 | 10 | 10 | —I— | 18 | 12 | 32 | 12 | 11 | 11 | 21 | 14 | 13 | 20 | 17 | 20 | 10 | 10 | 10 | 10 | 10 | 10 |
| S277-280 | 10 | 10 | 19 | 16 | —I— | 10 | 10 | 28 | 9 | 12 | 13 | 20 | 13 | 544 | 17 | 20 | 22 | 14 | 19 | 19 | 19 | 19 | 19 |
| S308 | 2 | 0 | 10 | 10 | 10 | 10 | 10 | 18 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 10 | 20 | 19 | 10 | 10 | 12 |
| S316-322 | 2 | 1 | 24 | 24 | 24 | 24 | 24 | ( 58) | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 27 | 24 | 24 | 26 | 24 | 24 | 24 |
| S316-322 | 2 | 1 | 28 | 28 | 27 | 27 | 28 | ( 59) | 31 | 28 | 28 | 30 | 28 | 28 | 28 | 28 | 28 | 29 | 29 | 68 | 29 | 29 | 29 |
| S316-322 | 2 | 1 | ( 31) | ( 31) | ( 28) | ( 28) | ( 29) | 60 | ( 32) | ( 31) | ( 31) | ( 31) | ( 31) | ( 31) | ( 31) | ( 31) | ( 32) | ( 31) | ( 31) | ( 84) | ( 31) | ( 31) | ( 31) |
| S316-322 | 2 | 1 | ( 31) | ( 31) | ( 29) | ( 29) | ( 29) | ( 61) | ( 32) | ( 31) | ( 31) | 32 | ( 31) | ( 31) | ( 31) | ( 32) | ( 32) | 32 | ( 31) | ( 103) | ( 31) | ( 31) | ( 31) |
| S316-322 | 2 | 1 | ( 33) | ( 33) | ( 29) | ( 29) | ( 30) | 64 | ( 33) | ( 33) | ( 33) | ( 33) | ( 33) | ( 33) | ( 33) | ( 33) | ( 33) | ( 32) | ( 32) | ( 81) | ( 32) | ( 32) | ( 32) |
| S316-322 | 2 | 1 | ( 34) | ( 34) | ( 33) | ( 30) | ( 31) | 65 | ( 35) | ( 34) | ( 34) | ( 35) | ( 34) | ( 34) | ( 34) | ( 33) | ( 34) | ( 34) | ( 33) | ( 79) | ( 33) | ( 33) | ( 33) |
| S316-322 | 2 | 1 | ( 34) | ( 34) | ( 34) | ( 32) | ( 31) | ( 70) | 35 | ( 34) | ( 34) | ( 35) | ( 34) | ( 34) | ( 34) | ( 34) | ( 35) | ( 35) | 34 | —I— | 34 | 34 | 34 |
| SCHMVETT | 3 | 0 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 9 | 28 | 13 | 8 | 8 |
| SCHMVETT | 10 | 0 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 57 | 15 | 9 | 9 |
| SCHMVETT | 100 | 0 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 7 | —S— | 33 | 10 | 15 |
| SCHMVETT | 500 | 0 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 12 | —E— | 21 | 10 | 31 |
| SCHMVETT | 1000 | 0 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 11 | 4 | 19 | —S— | 22 | 10 | 11 |
| SCHMVETT | 5000 | 0 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 4 | 22 | —T— | 21 | 11 | 20 |
| SCHMVETT | 10000 | 0 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 8 | 4 | 22 | —T— | 24 | 10 | 11 |
| SEMICON1 | 12 | 10 | 102 | —S— | —S— | —S— | —F— | —F— | —S— | —S— | 102 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —F— | —S— | —S— | —S— |
| SEMICON1 | 52 | 50 | 423 | 188 | 343 | 195 | —F— | —F— | 374 | 410 | 423 | 592 | 278 | 592 | 478 | —F— | —F— | 227 | —F— | —F— | 407 | 455 | —F— |
| SEMICON1 | 102 | 100 | 823 | 393 | —F— | 251 | —F— | —F— | 698 | 776 | 819 | 551 | 499 | 551 | 751 | —F— | —F— | 288 | —F— | —F— | 637 | 806 | —F— |
| SEMICON1 | 502 | 500 | 652 | 651 | —F— | 440 | —F— | —F— | —F— | —F— | 652 | 643 | 738 | 643 | —F— | —F— | —F— | 414 | —F— | —F— | 860 | 730 | —F— |
| SEMICON2 | 12 | 10 | 37 | —S— | 36 | 45 | 227 | 856 | 68 | 37 | 37 | 36 | 36 | 36 | 36 | 48 | 66 | 46 | 166 | 225 | 59 | 59 | 59 |
| SEMICON2 | 52 | 50 | 84 | 64 | 85 | 70 | 417 | —F— | 165 | 162 | 84 | 81 | 92 | 81 | 86 | 116 | 87 | 71 | —F— | —F— | 95 | 95 | —F— |
| SEMICON2 | 102 | 100 | 108 | 87 | 102 | 89 | 315 | —F— | 152 | 209 | 108 | 108 | 108 | 108 | 108 | 143 | 107 | 91 | —F— | —F— | 119 | 119 | 119 |
| SEMICON2 | 502 | 500 | 116 | 111 | 116 | 116 | —T— | —F— | —T— | 183 | 116 | 116 | 116 | 116 | 116 | 131 | 123 | 116 | —F— | —F— | 179 | 179 | —F— |
| SEMICON2 | 1002 | 1000 | 133 | 98 | 133 | 133 | —T— | —F— | —T— | 136 | 133 | 133 | 133 | 133 | 133 | 133 | 144 | 133 | —F— | —F— | 201 | 201 | 201 |
| SIMPLLPA | 2 | 2 | 5 | 5 | 5 | 5 | 5 | 11 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| SIMPLLPB | 2 | 3 | 4 | 4 | 5 | 4 | 5 | 11 | 5 | 4 | 4 | 6 | 4 | 4 | 7 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| SINQUAD | 5 | 0 | 12 | 12 | 12 | 12 | 17 | 33 | 13 | 22 | 12 | 25 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 |
| SINQUAD | 50 | 0 | 35 | 35 | 12 | 12 | 24 | 18 | 41 | 40 | 36 | 41 | 12 | 12 | 12 | 38 | 35 | 32 | 46 | 45 | 38 | 38 | 38 |
| SINQUAD | 100 | 0 | 50 | 50 | 12 | 12 | 30 | 23 | 49 | 53 | 58 | 65 | 12 | 12 | 12 | 53 | 53 | 51 | 59 | 54 | 56 | 56 | 56 |
| SINQUAD | 500 | 0 | 83 | 83 | 12 | 12 | 44 | 44 | 93 | 88 | 90 | 77 | 12 | 12 | 27 | 95 | 95 | ( 51) | 91 | 82 | 94 | 94 | 100 |
| SINQUAD | 1000 | 0 | 112 | 112 | 12 | 12 | 65 | 62 | 116 | 111 | 120 | 106 | 12 | 12 | 33 | 105 | 100 | 102 | 127 | 126 | 125 | 125 | 117 |
| SINQUAD | 5000 | 0 | ( 143) | ( 143) | 12 | 12 | ( 96) | —I— | 208 | 202 | 212 | 172 | 13 | 13 | 44 | 195 | 200 | —T— | 210 | 179 | 198 | 198 | 173 |
| SINQUAD | 10000 | 0 | 229 | 229 | 17 | 15 | 130 | —I— | 265 | 295 | 207 | —T— | 17 | 17 | —T— | 255 | 294 | —T— | 272 | 239 | 276 | 276 | 269 |
| SISSER | 2 | 0 | 13 | 15 | 13 | 13 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 14 | 13 | 13 | 11 |
| SNAIL | 2 | 0 | 77 | 77 | 73 | 72 | 78 | 69 | 77 | 77 | 77 | 85 | 76 | 70 | 71 | 76 | 63 | 67 | 109 | —I— | 93 | 214 | 233 |
| SPANHYD | 97 | 33 | 35 | 96 | —I— | 110 | 20 | —I— | 34 | 31 | 28 | —I— | 37 | 334 | 36 | 26 | 33 | 31 | 109 | —I— | —I— | 114 | —I— |
| SPMSQRT | 28 | 0 | 11 | 16 | 12 | 12 | 11 | 12 | 11 | 11 | 11 | 12 | 11 | 12 | 11 | 13 | 11 | 12 | 12 | —I— | 10 | 10 | 12 |
| SPMSQRT | 100 | 0 | 13 | 26 | 14 | 14 | 11 | 11 | 12 | 12 | 13 | 14 | 13 | 15 | 13 | 15 | 13 | 13 | 16 | —I— | 11 | 13 | 30 |
| SPMSQRT | 499 | 0 | 16 | 35 | 16 | 13 | 14 | 21 | 14 | 20 | 16 | 17 | 16 | 17 | 15 | —I— | 19 | 13 | 20 | —S— | 19 | 15 | 40 |
| SPMSQRT | 1000 | 0 | 18 | 42 | 19 | 13 | 15 | 18 | 13 | 15 | 18 | 20 | 16 | 20 | 15 | —I— | 19 | 13 | 19 | —I— | 16 | 16 | 92 |
| SPMSQRT | 4999 | 0 | 18 | —T— | 29 | 18 | 16 | —T— | 20 | 18 | 18 | 23 | 20 | 23 | 17 | —T— | 26 | 15 | 39 | —I— | 15 | 20 | 52 |
| SPMSQRT | 10000 | 0 | 20 | —T— | 41 | —T— | 18 | —T— | 23 | 24 | 20 | 24 | 19 | 29 | 17 | —T— | 29 | —T— | 36 | —T— | 20 | 28 | 89 |
| SROSENBR | 10 | 0 | 7 | 7 | 7 | 7 | 10 | 11 | 8 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 50 | 0 | 7 | 7 | 7 | 7 | 10 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 100 | 0 | 7 | 7 | 7 | 7 | 10 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 500 | 0 | 10 | 10 | 7 | 7 | 10 | 11 | 7 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 10 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 1000 | 0 | 10 | 10 | 7 | 7 | 10 | 11 | 7 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 7 | 10 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 5000 | 0 | 10 | 10 | 7 | 7 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 8 | 10 | 17 | 17 | 13 | 13 | 13 |
| SROSENBR | 10000 | 0 | 10 | 10 | 7 | 7 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | —T— | 20 | 20 | 13 | 13 | 13 |
| SSEBLIN | 194 | 72 | 65 | 67 | —I— | —I— | 54 | —I— | 71 | 72 | 65 | —I— | 70 | —I— | 57 | 64 | 69 | 63 | 67 | 66 | 64 | 65 | 67 |

Number of gradient evaluations ( 15 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSEBNLN | 194 | 96 | 66 | 62 | —I— | —I— | 53 | —I— | 69 | 70 | 67 | 106 | 68 | 94 | 58 | 64 | 69 | 65 | 66 | 66 | 68 | 67 | 66 |
| STEENBRA | 432 | 108 | 52 | 59 | —I— | —I— | 31 | —I— | 53 | 50 | 53 | —I— | 32 | —I— | —I— | 63 | 56 | 34 | 58 | 52 | 48 | 57 | —I— |
| STEENBRB | 468 | 108 | —I— | —I— | —I— | 431 | —I— | ( 329) | 346 | 144 | 328 | —E— | 109 | —I— | 315 | 130 | —I— | 349 | —I— | —I— | —I— | 517 | —I— |
| STEENBRC | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 116) | —I— | —I— | —I— | —E— | ( 110) | —I— | 279 | —I— | —I— | 98 | —I— | —I— | —I— | 526 | —I— |
| STEENBRD | 468 | 108 | —I— | 448 | —I— | —I— | —I— | ( 278) | ( 158) | —I— | —I— | —E— | ( 128) | —E— | 625 | —I— | —I— | ( 107) | —I— | —I— | ( 771) | ( 459) | —I— |
| STEENBRE | 540 | 126 | 636 | —I— | —I— | —I— | —I— | ( 208) | —I— | —I— | —I— | —I— | 152 | —E— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 595 | —I— |
| STEENBRF | 468 | 108 | —I— | —I— | —I— | 712 | —I— | ( 165) | 102 | 145 | —I— | —E— | 116 | ( 209) | 180 | 654 | —I— | 83 | —I— | —I— | 413 | 458 | —I— |
| STEENBRG | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 177) | —I— | —I— | —I— | —E— | 173 | —E— | 418 | —I— | —I— | 117 | —I— | —I— | —I— | ( 685) | —I— |
| SVANBERG | 10 | 10 | 46 | 46 | —I— | 30 | 33 | 27 | 35 | 42 | 39 | 53 | 48 | 39 | 36 | 44 | 99 | 39 | 47 | 82 | 47 | 47 | 48 |
| SVANBERG | 20 | 20 | 49 | 49 | 97 | 33 | 36 | 27 | 48 | 43 | 49 | 49 | 65 | 46 | 57 | 46 | 62 | 38 | 45 | 103 | 45 | 45 | 44 |
| SVANBERG | 30 | 30 | 61 | 61 | 263 | 34 | 39 | 28 | 48 | 49 | 48 | 45 | 98 | 64 | 78 | 45 | 167 | 41 | 58 | 197 | 58 | 58 | 50 |
| SVANBERG | 40 | 40 | 59 | 59 | 112 | 40 | 45 | 29 | 45 | 42 | 47 | 52 | 77 | 55 | 78 | 46 | 129 | 45 | 54 | 219 | 54 | 54 | 55 |
| SVANBERG | 50 | 50 | 55 | 55 | —I— | 43 | 37 | 30 | 40 | 48 | 58 | 74 | 79 | 68 | 76 | 60 | 111 | 43 | 62 | 342 | 62 | 62 | 59 |
| SVANBERG | 60 | 60 | 59 | 59 | 745 | 43 | 35 | 31 | 45 | 44 | 55 | 55 | 112 | 54 | 80 | 62 | 67 | 43 | 51 | 381 | 52 | 51 | 50 |
| SVANBERG | 70 | 70 | 61 | 61 | 215 | 42 | 40 | 31 | 45 | 49 | 60 | 69 | 99 | 76 | 72 | 46 | 178 | 42 | 62 | 415 | 59 | 61 | 62 |
| SVANBERG | 80 | 80 | 57 | 57 | 440 | 45 | 44 | 34 | 47 | 48 | 60 | 57 | 74 | 67 | 68 | 63 | 103 | 46 | 50 | 451 | 53 | 52 | 53 |
| SVANBERG | 90 | 90 | 55 | 55 | 202 | 45 | 47 | 35 | 44 | 64 | 62 | 61 | 91 | 70 | 80 | 62 | 190 | 47 | 53 | 433 | 58 | 54 | 51 |
| SVANBERG | 100 | 100 | 65 | 65 | 941 | 49 | 48 | 38 | 60 | 68 | 71 | 73 | 91 | 63 | 80 | 69 | 138 | 50 | 62 | 409 | 62 | 63 | 62 |
| SVANBERG | 500 | 500 | 75 | 75 | —I— | —T— | 48 | 41 | 53 | 68 | 91 | 77 | 110 | 99 | 84 | 86 | 206 | 58 | 86 | 800 | 88 | 81 | 87 |
| SVANBERG | 1000 | 1000 | 85 | 85 | —I— | —T— | —T— | 42 | 70 | —T— | 120 | 98 | 129 | 114 | 71 | 67 | 138 | 64 | 90 | 653 | 85 | 79 | 117 |
| SVANBERG | 5000 | 5000 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| TAME | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| TENBARS1 | 18 | 9 | 711 | 444 | —I— | —I— | 431 | —I— | —S— | 421 | —S— | 782 | —I— | 260 | 473 | —S— | 423 | —S— | —I— | —I— | 304 | —S— | —I— |
| TENBARS2 | 18 | 8 | 321 | 468 | —I— | —I— | 232 | —I— | 476 | 288 | 419 | 288 | —I— | 291 | 500 | —S— | 297 | 298 | 518 | —I— | 312 | 271 | —I— |
| TENBARS3 | 18 | 8 | 210 | 346 | —I— | —I— | 157 | —I— | 376 | 192 | 345 | 216 | —I— | 264 | 467 | 171 | 220 | 311 | 370 | —I— | 211 | 209 | —I— |
| TENBARS4 | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| TOINTGOR | 50 | 0 | 10 | 12 | 9 | 9 | 9 | 57 | 10 | 10 | 10 | 10 | 9 | 9 | 10 | 10 | 12 | 10 | 10 | 10 | 10 | 10 | 10 |
| TOINTGSS | 10 | 0 | 3 | 3 | 0 | 3 | 13 | 21 | ( 10) | 3 | 3 | 3 | 3 | 3 | 3 | 13 | ( 11) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 50 | 0 | 3 | 3 | 3 | 3 | ( 11) | 9 | ( 9) | 3 | 3 | 3 | 3 | 3 | 3 | 11 | ( 11) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 100 | 0 | 3 | 3 | 3 | 3 | ( 8) | ( 10) | ( 9) | 3 | 3 | 3 | 3 | 3 | 3 | ( 7) | ( 11) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 500 | 0 | 3 | 3 | 3 | 3 | ( 8) | ( 10) | ( 7) | 3 | 3 | 3 | 3 | 3 | 3 | 11 | ( 12) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 1000 | 0 | 3 | 3 | 3 | 3 | ( 8) | ( 9) | ( 7) | 3 | 3 | 3 | 3 | 3 | 3 | 12 | ( 12) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 5000 | 0 | 3 | 3 | 3 | 3 | ( 8) | ( 9) | ( 6) | 3 | 3 | 3 | 3 | 3 | 3 | 12 | ( 13) | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTGSS | 10000 | 0 | 3 | 3 | 3 | 3 | 8 | ( 9) | ( 6) | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 13 | 3 | 3 | 3 | 3 | 3 | 3 |
| TOINTPSP | 50 | 0 | 21 | 21 | 22 | 21 | 30 | 30 | 25 | 23 | 21 | 24 | 22 | 22 | 22 | 28 | 28 | 22 | 21 | 21 | 21 | 21 | 21 |
| TOINTQOR | 50 | 0 | 7 | 9 | 5 | 5 | 6 | 19 | 7 | 7 | 7 | 7 | 5 | 5 | 6 | 7 | 9 | 8 | 7 | 7 | 7 | 7 | 7 |
| TORSIONA | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 8 | 3 | 3 | 3 |
| TORSIONA | 100 | 0 | 4 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 36 | 5 | 5 | 5 |
| TORSIONA | 484 | 0 | 8 | 9 | 7 | 7 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 8 | 8 | 8 | 8 | 9 | 273 | 9 | 9 | 9 |
| TORSIONA | 1024 | 0 | 11 | 12 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | 11 | 11 | 11 | 11 | 11 | 929 | 11 | 11 | 11 |
| TORSIONA | 5476 | 0 | 24 | 25 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | 24 | —I— | 24 | 24 | 24 |
| TORSIONA | 10000 | 0 | 32 | 33 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | —I— | 32 | 32 | 32 |
| TORSIONA | 14884 | 0 | 38 | 41 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 38 | 39 | —T— | 39 | 39 | 39 |
| TORSIONB | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 9 | 3 | 3 | 3 |
| TORSIONB | 100 | 0 | 5 | 6 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 5 | 5 | 6 | 6 | 31 | 6 | 6 | 6 |
| TORSIONB | 484 | 0 | 6 | 7 | 12 | 5 | 5 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 6 | 6 | 8 | 211 | 8 | 8 | 8 |
| TORSIONB | 1024 | 0 | 6 | 8 | 24 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 10 | 485 | 10 | 10 | 10 |
| TORSIONB | 5476 | 0 | 10 | 12 | 146 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 5 | 6 | 11 | 18 | —I— | 18 | 18 | 18 |
| TORSIONB | 10000 | 0 | 13 | 15 | 249 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 8 | 8 | 14 | 24 | —I— | 24 | 24 | 24 |
| TORSIONB | 14884 | 0 | 16 | 18 | —T— | —I— | 16 | 16 | 16 | 16 | 16 | 15 | 15 | 15 | —T— | —T— | —T— | 16 | 28 | —T— | 28 | 28 | 28 |
| TORSIONC | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONC | 100 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 8 | 3 | 3 | 3 |
| TORSIONC | 484 | 0 | 5 | 6 | 4 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 64 | 6 | 6 | 6 |
| TORSIONC | 1024 | 0 | 6 | 7 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 131 | 7 | 7 | 7 |
| TORSIONC | 5476 | 0 | 12 | 14 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 13 | 13 | —I— | 13 | 13 | 13 |
| TORSIONC | 10000 | 0 | 16 | 18 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 16 | 17 | —I— | 17 | 17 | 17 |
| TORSIONC | 14884 | 0 | 20 | 22 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 21 | —I— | 21 | 21 | 21 |
| TORSIOND | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| TORSIOND | 100 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 9 | 4 | 4 | 4 |

Number of gradient evaluations ( 16 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TORSIOND | 484 | 0 | 5 | 6 | 6 | 4 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 60 | 6 | 6 | 6 |
| TORSIOND | 1024 | 0 | 6 | 7 | 10 | 5 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 6 | 5 | 6 | 7 | 216 | 7 | 7 | 7 |
| TORSIOND | 5476 | 0 | 10 | 12 | 34 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 6 | 7 | 10 | 11 | —I— | 11 | 11 | 11 |
| TORSIOND | 10000 | 0 | 12 | 15 | 79 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 12 | 6 | —T— | 12 | 14 | —I— | 14 | 14 | 14 |
| TORSIOND | 14884 | 0 | 15 | 17 | 118 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | —T— | —T— | 15 | 16 | —I— | 16 | 16 | 16 |
| TORSIONE | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONE | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONE | 484 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 10 | 3 | 3 | 3 |
| TORSIONE | 1024 | 0 | 4 | 5 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 88 | 5 | 5 | 5 |
| TORSIONE | 5476 | 0 | 7 | 9 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 244 | 7 | 7 | 8 |
| TORSIONE | 10000 | 0 | 9 | 10 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 10 | 711 | 10 | 10 | 10 |
| TORSIONE | 14884 | 0 | 10 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | —I— | 11 | 11 | 11 |
| TORSIONF | 16 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| TORSIONF | 100 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| TORSIONF | 484 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 6 | 3 | 4 | 10 | 4 | 4 | 4 |
| TORSIONF | 1024 | 0 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 5 | 5 | 70 | 5 | 5 | 5 |
| TORSIONF | 5476 | 0 | 6 | 8 | 12 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 6 | 8 | 517 | 8 | 8 | 8 |
| TORSIONF | 10000 | 0 | 8 | 10 | 14 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 10 | 8 | 9 | 775 | 9 | 9 | 9 |
| TORSIONF | 14884 | 0 | 8 | 12 | 30 | 8 | 8 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | —T— | —T— | 8 | 10 | —I— | 10 | 10 | 10 |
| TQUARTIC | 5 | 0 | 2 | 2 | 9 | 9 | 9 | 3 | 2 | 5 | 2 | 5 | 2 | 2 | 2 | 2 | 11 | 2 | 2 | 2 | 2 | 2 | 2 |
| TQUARTIC | 10 | 0 | 6 | 6 | 16 | 11 | 10 | 4 | 2 | 6 | 2 | 6 | 2 | 2 | 2 | 6 | 12 | 7 | 6 | 6 | 6 | 6 | 6 |
| TQUARTIC | 50 | 0 | 9 | 9 | 11 | 11 | 9 | 9 | 2 | 7 | 17 | 17 | 2 | 2 | 2 | 18 | 13 | 6 | 9 | 9 | 9 | 9 | 9 |
| TQUARTIC | 100 | 0 | 12 | 12 | 13 | 13 | 11 | 14 | 2 | 9 | 16 | 15 | 2 | 2 | 2 | 12 | 15 | 8 | 12 | 10 | 12 | 12 | 12 |
| TQUARTIC | 500 | 0 | 14 | 14 | 14 | 10 | 12 | 31 | 2 | 11 | 13 | 2 | 2 | 2 | 2 | 14 | 14 | 8 | 14 | 14 | 14 | 14 | 14 |
| TQUARTIC | 1000 | 0 | 12 | 12 | 13 | 11 | 13 | 44 | 2 | 17 | 15 | 2 | 2 | 2 | 2 | 12 | 12 | 8 | 12 | 13 | 12 | 12 | 12 |
| TQUARTIC | 5000 | 0 | 19 | 19 | 11 | —T— | 12 | 99 | 2 | 11 | 17 | 2 | 2 | 2 | 2 | 19 | 26 | 13 | 18 | 17 | 18 | 18 | 18 |
| TQUARTIC | 10000 | 0 | 17 | 17 | 13 | —T— | 12 | 140 | 2 | 11 | 21 | 2 | 2 | 2 | 2 | 17 | 59 | 13 | 17 | 18 | 17 | 17 | 17 |
| TRIDIA | 10 | 0 | 2 | 2 | 2 | 2 | 6 | 12 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| TRIDIA | 20 | 0 | 3 | 2 | 3 | 3 | 5 | 16 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 30 | 0 | 3 | 2 | 3 | 3 | 5 | 20 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 50 | 0 | 3 | 2 | 3 | 3 | 5 | 25 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 100 | 0 | 3 | 2 | 3 | 3 | 5 | 34 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 5 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 500 | 0 | 3 | 2 | 3 | 3 | 5 | 73 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 1000 | 0 | 3 | 2 | 3 | 3 | 5 | 102 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 5000 | 0 | 3 | 2 | 3 | 3 | 5 | 227 | 7 | 3 | 3 | 3 | 3 | 3 | 6 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 10000 | 0 | 3 | 2 | 3 | 3 | 5 | 319 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIGGER | 7 | 6 | 20 | —F— | 30 | 16 | —S— | —I— | —I— | —I— | 20 | 19 | 17 | 29 | 33 | 20 | —S— | 19 | 18 | 13 | 21 | 21 | 21 |
| VARDIM | 10 | 0 | 15 | 17 | 15 | 15 | 15 | 280 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| VARDIM | 50 | 0 | 23 | 27 | 23 | 23 | 23 | —I— | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| VARDIM | 100 | 0 | 26 | 32 | 26 | 26 | 26 | —I— | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 27 | 26 | 26 | 26 | 26 | 26 | 26 |
| VAREIGVL | 10 | 0 | 16 | 16 | 22 | 12 | 10 | 16 | 11 | 13 | 15 | 13 | 27 | 17 | 12 | 13 | 12 | 12 | 19 | 7 | 14 | 14 | 15 |
| VAREIGVL | 50 | 0 | 14 | 15 | 14 | 14 | 12 | 18 | 15 | 15 | 14 | 14 | 14 | 14 | 13 | 14 | 14 | 14 | 11 | 8 | 13 | 14 | 14 |
| VAREIGVL | 100 | 0 | 13 | 14 | 13 | 13 | 12 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 18 | 13 | 12 | —I— | 12 | 13 | 25 |
| VAREIGVL | 500 | 0 | 13 | 15 | 13 | 13 | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 15 | 13 | 16 | —I— | 12 | 12 | 17 |
| VAREIGVL | 1000 | 0 | 13 | 15 | 13 | 13 | 13 | 16 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 13 | 16 | 14 | 14 | —I— | 13 | 13 | 15 |
| VAREIGVL | 5000 | 0 | 14 | 15 | —M— | —M— | 14 | 19 | 14 | 14 | 14 | —M— | —M— | —M— | —M— | 14 | 18 | 14 | 13 | —T— | 13 | 13 | 18 |
| WATSON | 12 | 0 | 9 | 12 | —I— | 10 | 10 | 9 | 10 | 9 | 9 | 11 | 24 | 9 | 8 | 9 | 8 | 10 | 137 | 137 | 17 | 14 | 15 |
| WATSON | 31 | 0 | 11 | 435 | —I— | 95 | 10 | 33 | 12 | 12 | 10 | 24 | 12 | 51 | 10 | 11 | 12 | 11 | 14 | 14 | 16 | 18 | 18 |
| WOODS | 4 | 0 | 21 | 27 | 20 | 21 | 21 | 280 | 20 | 23 | 21 | 20 | 21 | 21 | 21 | 25 | 22 | 21 | 14 | 14 | 21 | 21 | 21 |
| WOODS | 100 | 0 | 21 | 27 | 25 | 20 | 22 | 280 | 20 | 23 | 21 | 21 | 21 | 21 | 21 | 24 | 23 | 20 | 13 | 13 | 21 | 21 | 21 |
| WOODS | 1000 | 0 | 23 | 25 | 30 | 20 | 21 | 280 | 21 | 21 | 23 | 23 | 23 | 23 | 23 | 24 | 21 | 22 | 13 | 13 | 23 | 23 | 23 |
| WOODS | 10000 | 0 | 23 | 25 | 25 | —T— | 21 | 280 | 21 | 21 | 23 | 23 | 23 | 23 | 23 | 21 | 24 | —T— | 14 | 14 | 23 | 23 | 23 |
| ZANGWIL2 | 2 | 0 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| ZANGWIL3 | 3 | 0 | 8 | 8 | 8 | 8 | 8 | 246 | 8 | 11 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| ZIGZAG | 64 | 50 | 34 | 34 | —I— | 173 | 28 | 63 | 37 | 39 | 38 | 35 | 34 | 32 | 39 | 35 | 37 | 33 | 35 | 42 | 35 | 42 | 36 |
| ZIGZAG | 304 | 250 | 83 | 247 | —I— | —I— | 192 | 479 | 85 | 82 | 96 | 96 | 79 | —I— | 79 | 86 | 87 | 81 | 214 | 214 | 89 | 83 | 85 |
| ZIGZAG | 604 | 500 | 90 | —I— | —I— | —I— | —T— | 949 | 113 | 127 | 91 | 99 | 85 | —I— | 90 | 90 | 87 | 86 | —S— | —S— | 92 | 86 | 85 |
| ZIGZAG | 3004 | 2500 | —T— | —T— | —T— | —T— | —T— | —I— | —T— | —T— | 146 | —T— | 83 | —T— | 93 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |

## 5 Number of conjugate gradient iterations

This section presents the number of cumulated conjugate gradient iterations required by the 21 algorithmic variants for convergence. The column headings in the tables refer to these variants, using the terminology of the paper. Other conventions are as in the previous section.

Number of cg-iterations ( 1 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGG | 163 | 488 | —T— | —T— | —I— | —I— | —T— | —I— | —S— | —S— | —T— | —I— | —S— | —I— | —T— | —S— | —I— | —S— | —T— | —T— | —T— | —T— | —T— |
| AIRCRFTA | 8 | 5 | 2 | 3 | 0 | 0 | 9 | 78 | 9 | 9 | 2 | 2 | 12 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| AIRCRFTB | 8 | 0 | 14 | 17 | 0 | 0 | 43 | 45 | 43 | 40 | 14 | 25 | 10 | 10 | 12 | 15 | 15 | 21 | 19 | —S— | 16 | 14 | 15 |
| ALJAZZAF | 3 | 1 | 4 | 4 | 0 | 0 | 7 | —I— | 3 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | —I— | 5 | 5 | 5 |
| ARGAUSS | 3 | 0 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARGLINA | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINA | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINB | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINB | 50 | 0 | 0 | —S— | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINB | 100 | 0 | 0 | —S— | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 6 | 0 | —S— | —S— | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINC | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINC | 50 | 0 | 0 | —S— | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINC | 100 | 0 | 0 | —S— | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 9 | 0 | —S— | —S— | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGTRIG | 10 | 0 | 11 | 11 | 0 | 0 | 61 | 23 | 9 | 10 | 9 | 7 | 9 | 7 | 7 | 9 | 6 | 14 | 6 | 6 | 11 | 11 | 11 |
| ARGTRIG | 50 | 0 | 13 | 13 | 0 | 0 | 212 | 21 | 36 | 51 | 9 | 8 | 4 | 5 | 7 | 13 | 18 | 20 | 6 | 6 | 8 | 8 | 8 |
| ARGTRIG | 100 | 0 | 23 | 23 | 0 | 0 | 562 | 21 | 29 | 41 | 15 | 6 | 4 | 5 | 7 | 23 | 25 | 23 | 6 | 6 | 5 | 5 | 5 |
| ARTIF | 12 | 0 | 13 | 9 | 0 | 0 | 50 | 19 | 15 | 13 | 13 | 13 | 12 | 13 | 13 | 16 | 17 | 41 | 6 | 6 | 5 | 5 | 5 |
| ARTIF | 52 | 0 | 20 | 21 | 0 | 0 | 322 | 19 | 23 | 20 | 20 | 27 | 25 | 27 | 27 | 17 | 25 | 247 | 13 | 13 | 12 | 12 | 12 |
| ARTIF | 102 | 0 | 34 | 40 | 0 | 0 | 47438 | 220 | 37 | 34 | 34 | 55 | 43 | 55 | 38 | 40 | 37 | 570 | 47 | 47 | 25 | 25 | 25 |
| ARTIF | 502 | 0 | 38 | 40 | 0 | 0 | 1316 | 130 | 39 | 38 | 38 | 54 | 44 | 54 | 42 | 34 | 31 | 801 | 54 | 54 | 27 | 27 | 27 |
| ARTIF | 1002 | 0 | 38 | 44 | 0 | 0 | 1160 | 173 | 38 | 38 | 38 | 46 | 45 | 46 | 45 | 34 | 28 | 812 | 47 | 47 | 27 | 27 | 27 |
| ARTIF | 5002 | 0 | 38 | 48 | 0 | —T— | 1205 | 196 | 38 | 38 | 38 | 63 | 43 | 63 | 45 | 37 | 41 | 812 | 51 | 51 | 25 | 25 | 25 |
| ARWHEAD | 100 | 0 | 2 | 2 | 0 | 0 | 4 | 27 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| ARWHEAD | 500 | 0 | 1 | 1 | 0 | 0 | 2 | 55 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| ARWHEAD | 1000 | 0 | 1 | 1 | 0 | 0 | 2 | 80 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARWHEAD | 5000 | 0 | 1 | 1 | 0 | 0 | 2 | 67 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| BARD | 3 | 0 | 6 | 6 | 0 | 0 | 31 | 14 | 28 | 30 | 6 | 19 | 9 | 7 | 11 | 6 | 6 | 6 | 11 | —I— | 8 | 9 | 9 |
| BDEXP | 100 | 0 | 12 | 26 | 0 | 0 | 19 | 11 | 66 | 137 | 12 | 10 | 10 | 10 | 10 | 12 | 11 | 15 | 17 | 18 | 16 | 24 | 23 |
| BDEXP | 500 | 0 | ( 12) | ( 26) | ( 0) | ( 0) | ( 19) | 6 | ( 66) | ( 143) | ( 12) | ( 10) | ( 10) | ( 10) | ( 10) | ( 12) | ( 12) | ( 15) | 17 | 18 | ( 16) | 31 | ( 29) |
| BDEXP | 1000 | 0 | ( 12) | ( 26) | ( 0) | ( 0) | ( 19) | 3 | ( 66) | ( 143) | ( 12) | ( 10) | ( 10) | ( 10) | ( 10) | ( 12) | ( 12) | ( 15) | ( 17) | 18 | ( 16) | ( 29) | ( 28) |
| BDEXP | 5000 | 0 | ( 12) | ( 26) | ( 0) | ( 0) | ( 19) | ( 14) | ( 66) | ( 143) | ( 12) | ( 10) | ( 10) | ( 10) | ( 10) | ( 12) | ( 11) | ( 15) | ( 17) | 18 | ( 16) | ( 133) | ( 33) |
| BDQRTIC | 100 | 0 | 12 | 8 | 0 | 0 | 56 | 102 | 18 | 17 | 12 | 12 | 9 | 9 | 9 | 12 | 13 | 12 | 13 | 13 | 13 | 13 | 13 |
| BDQRTIC | 500 | 0 | 13 | 8 | 0 | 0 | 66 | 207 | 18 | 17 | 13 | 13 | 9 | 9 | 9 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | 21 |
| BDQRTIC | 1000 | 0 | 13 | 10 | 0 | 0 | 66 | 298 | 17 | 17 | 13 | 13 | 9 | 9 | 11 | 13 | 14 | 13 | 13 | 13 | 13 | 13 | —S— |
| BDVALUE | 12 | 0 | 2 | 2 | 0 | 0 | 20 | 20 | 28 | 18 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BDVALUE | 52 | 0 | 1 | 1 | 0 | 0 | 1406 | 1050 | 847 | 74 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 102 | 0 | 1 | 1 | 0 | 0 | 300 | 300 | 289 | 91 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 502 | 0 | 1 | 1 | 0 | 0 | 19 | 32 | 1 | 80 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 1002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BDVALUE | 5002 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BEALE | 2 | 0 | 7 | —E— | 0 | 0 | 7 | 225 | 10 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 6 | 7 | 6 | 10 | 7 | 8 | 8 |
| BIGBANK | 2230 | 1112 | —T— | —T— | 0 | 0 | —T— | —I— | —T— | —T— | —T— | —T— | 59 | 59 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| BIGGS3 | 6 | 0 | 9 | 10 | 0 | 0 | 25 | 24 | 22 | 21 | 9 | 11 | 9 | 9 | 9 | 11 | 10 | 13 | 17 | —S— | 9 | 11 | 11 |
| BIGGS5 | 6 | 0 | 55 | 57 | —I— | 0 | 52 | 154 | 172 | ( 134) | 55 | 60 | 45 | 57 | 47 | 55 | 63 | 141 | 44 | —I— | ( 411) | 38 | 46 |
| BIGGS6 | 6 | 0 | 113 | 51 | 0 | 0 | 71 | —I— | 208 | 90 | 113 | 68 | 123 | 84 | ( 89) | 93 | 82 | 289 | ( 280) | —I— | 86 | 58 | 90 |
| BOOTH | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 7 | 4 | 1 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BOX2 | 3 | 0 | 6 | 9 | 0 | 0 | 2 | 15 | 5 | 6 | 6 | 4 | 1 | 3 | 3 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| BOX3 | 3 | 0 | 6 | 14 | 0 | 0 | 14 | 16 | 17 | 16 | 6 | 12 | 7 | 6 | 6 | 6 | 6 | 7 | 9 | 9 | 9 | 9 | 9 |
| BQPGAUSS | 2003 | 0 | 2227 | —S— | —I— | 0 | 9878 | 8568 | 2928 | 2910 | 2528 | 1829 | 182 | 196 | 489 | 2708 | 2257 | 2623 | —I— | —S— | 3871 | 2646 | —I— |
| BRATU1D | 13 | 0 | 5 | 5 | 0 | 0 | 51 | 89 | 51 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | —S— | —S— | 11 | 9 | 437 |
| BRATU1D | 77 | 0 | 7 | 7 | 0 | 0 | 350 | 1130 | 333 | 7 | 7 | 8 | 7 | 7 | 7 | 7 | 9 | 7 | —I— | —I— | 12 | 9 | —I— |
| BRATU1D | 103 | 0 | 7 | 7 | 0 | 0 | 471 | —I— | 438 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 9 | —I— | —I— | 12 | 10 | —I— |
| BRATU1D | 503 | 0 | 8 | 8 | 0 | —E— | 2482 | —I— | 2469 | 8 | 8 | 9 | 8 | 8 | 8 | 7 | 13 | 9 | —E— | —I— | —E— | 8 | —E— |
| BRATU1D | 1003 | 0 | 7 | —E— | 0 | 0 | 4904 | —I— | 5465 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 13 | 10 | —E— | —I— | —E— | 8 | —E— |
| BRATU2D | 49 | 25 | 36 | 40 | 0 | 0 | 18 | 23 | 18 | 24 | 3 | 8 | 3 | 3 | 5 | 36 | 41 | 35 | 36 | 36 | 36 | 36 | 33 |
| BRATU2D | 100 | 64 | 38 | 40 | 0 | 0 | 39 | 53 | 37 | 38 | 58 | 3 | 3 | 3 | 6 | 38 | 47 | 38 | 38 | 38 | 38 | 38 | 38 |
| BRATU2D | 484 | 400 | 177 | 273 | 0 | 0 | 142 | 294 | 142 | 196 | 177 | 2 | 2 | 2 | 79 | 176 | 196 | 180 | 177 | 177 | 177 | 177 | 173 |
| BRATU2D | 1024 | 900 | 264 | 490 | 0 | 0 | 297 | 609 | 300 | 277 | 264 | 2 | 2 | 2 | 143 | 264 | 392 | 263 | 264 | 264 | 264 | 264 | 264 |
| BRATU2D | 5184 | 4900 | 1092 | 1906 | —F— | —F— | —F— | 2117 | 1451 | 1214 | 1092 | —F— | —F— | —F— | 107 | 1093 | 1794 | 1092 | 1093 | 1093 | 1093 | 1093 | 1093 |

Number of cg-iterations ( 2 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRATU3D | 27 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BRATU3D | 125 | 27 | 17 | 17 | 0 | 0 | 16 | 22 | 15 | 18 | 23 | 4 | 4 | 4 | 6 | 17 | 18 | 18 | 17 | 17 | 17 | 17 | 17 |
| BRATU3D | 512 | 216 | 58 | 58 | 0 | 0 | 40 | 74 | 36 | 46 | 31 | 3 | 3 | 3 | 17 | 58 | 70 | 68 | 58 | 58 | 58 | 58 | 57 |
| BRATU3D | 1000 | 512 | 70 | 95 | 0 | 0 | 81 | 126 | 71 | 71 | 49 | 3 | 3 | 3 | 23 | 70 | 82 | 75 | 70 | 70 | 70 | 70 | 70 |
| BRATU3D | 4913 | 3375 | 224 | 241 | 0 | 0 | 267 | 386 | 240 | 224 | 224 | 3 | 3 | 3 | 44 | 230 | 249 | 226 | 224 | 224 | 224 | 224 | 224 |
| BRIDGEND | 2734 | 2727 | —T— | —I— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —I— | —T— | 991 | —T— | —T— | —T— | —T— | —I— | —I— | —T— | —T— | —I— |
| BRITGAS | 450 | 360 | 9775 | 8915 | —I— | —I— | 25466 | 4908 | 2506 | 4355 | 6250 | 7497 | 2548 | 434 | 2915 | 5867 | 4802 | 5608 | —I— | —I— | 5990 | 20346 | —I— |
| BRKMCC | 2 | 0 | 2 | 3 | 0 | 0 | 5 | 7 | 5 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| BROWNAL | 10 | 0 | 37 | 37 | 0 | 0 | 6 | 13 | 6 | 47 | 3 | 8 | 3 | 3 | 3 | 38 | 40 | 32 | 27 | 26 | 34 | 34 | 34 |
| BROWNAL | 50 | 0 | 37 | 37 | 0 | 0 | 5 | 5 | 5 | 52 | 38 | 6 | 5 | 2 | 2 | 36 | 41 | 38 | 53 | 41 | 36 | 38 | 40 |
| BROWNBS | 2 | 0 | 16 | 16 | —I— | —I— | 29 | 5 | 15 | 16 | 16 | 14 | 23 | 17 | 26 | 17 | 21 | 29 | 45 | —I— | 18 | 16 | 17 |
| BROWNDEN | 4 | 0 | 9 | 11 | 0 | 0 | 24 | —I— | 31 | 15 | 9 | 24 | 9 | 9 | 9 | 10 | 10 | 11 | 12 | 66 | 11 | 9 | —I— |
| BROYDN3D | 10 | 0 | 5 | 5 | 0 | 0 | 24 | 39 | 21 | 9 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 50 | 0 | 5 | 5 | 0 | 0 | 26 | 42 | 23 | 11 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 100 | 0 | 5 | 5 | 0 | 0 | 27 | 39 | 24 | 11 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BROYDN3D | 500 | 0 | 5 | 5 | 0 | 0 | 29 | 39 | 25 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 1000 | 0 | 5 | 5 | 0 | 0 | 30 | 39 | 25 | 10 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 5000 | 0 | 5 | 5 | 0 | 0 | 29 | 37 | 23 | 9 | 5 | 5 | 5 | 5 | 5 | 5 | 6 | 5 | 4 | 4 | 8 | 8 | 8 |
| BROYDN3D | 10000 | 0 | 5 | 5 | 0 | 0 | 28 | 37 | 20 | 8 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 7 | 7 | 7 |
| BROYDN7D | 10 | 0 | 16 | 16 | ( 0) | 0 | 78 | ( 87) | ( 54) | 33 | 16 | 27 | 18 | ( 16) | ( 21) | 23 | 24 | 40 | ( 52) | ( 52) | 23 | 23 | 23 |
| BROYDN7D | 50 | 0 | ( 36) | ( 36) | ( 0) | ( 0) | ( 83) | ( 67) | ( 53) | 77 | ( 36) | ( 32) | ( 20) | ( 28) | ( 32) | ( 25) | ( 24) | ( 79) | ( 70) | ( 70) | ( 26) | ( 26) | ( 26) |
| BROYDN7D | 100 | 0 | ( 33) | ( 33) | ( 0) | ( 0) | ( 90) | ( 83) | ( 63) | 132 | ( 33) | ( 45) | ( 26) | ( 41) | ( 42) | ( 35) | ( 42) | ( 144) | ( 91) | ( 91) | ( 35) | ( 35) | ( 35) |
| BROYDN7D | 500 | 0 | ( 86) | ( 86) | ( 0) | ( 0) | ( 250) | ( 192) | ( 173) | 432 | ( 86) | ( 126) | ( 31) | ( 110) | ( 124) | ( 74) | ( 61) | ( 713) | ( 178) | ( 178) | ( 57) | ( 57) | ( 75) |
| BROYDN7D | 1000 | 0 | ( 132) | ( 132) | ( 0) | ( 0) | ( 434) | ( 355) | ( 297) | 356 | ( 132) | ( 204) | ( 42) | ( 89) | ( 29) | ( 127) | ( 117) | ( 1420) | ( 294) | ( 294) | ( 113) | ( 119) | ( 122) |
| BROYDNBD | 10 | 10 | 25 | 32 | 0 | 0 | 70 | 69 | 41 | 38 | 10 | 28 | 11 | 11 | 11 | 25 | 24 | 28 | 25 | 25 | 25 | 25 | 25 |
| BROYDNBD | 50 | 50 | 25 | 25 | 0 | 0 | 109 | 72 | 38 | 30 | 10 | 13 | 15 | 13 | 13 | 30 | 29 | 33 | 32 | 32 | 32 | 32 | 32 |
| BROYDNBD | 100 | 100 | 26 | 26 | 0 | 0 | 100 | 71 | 26 | 33 | 12 | 18 | 12 | 18 | 11 | 24 | 27 | 127 | 25 | 25 | 25 | 25 | 25 |
| BROYDNBD | 500 | 500 | 28 | 28 | 0 | 0 | 110 | 67 | 32 | 32 | 13 | 17 | 12 | 17 | 14 | 27 | 30 | 31 | 26 | 26 | 25 | 26 | 26 |
| BROYDNBD | 1000 | 1000 | 30 | 30 | 0 | 0 | 180 | 63 | 35 | 38 | 12 | 32 | 12 | 32 | 15 | 24 | 22 | 411 | 28 | 28 | 28 | 28 | 28 |
| BROYDNBD | 5000 | 5000 | 56 | 56 | 0 | 0 | 221 | 53 | 29 | 26 | 27 | 46 | 11 | 46 | 19 | —F— | 59 | 34 | 24 | 24 | 24 | 24 | 24 |
| CBRATU2D | 32 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CBRATU2D | 98 | 50 | 30 | 30 | 0 | 0 | 23 | 27 | 24 | 24 | 46 | 10 | 4 | 4 | 6 | 30 | 28 | 27 | 29 | 29 | 29 | 29 | 29 |
| CBRATU2D | 512 | 392 | 102 | 135 | 0 | 0 | 118 | 236 | 111 | 111 | 102 | 3 | 3 | 3 | 40 | 101 | 134 | 102 | 102 | 102 | 102 | 102 | 105 |
| CBRATU2D | 1058 | 882 | 211 | 292 | 0 | 0 | 244 | 407 | 237 | 237 | 211 | 3 | 3 | 3 | 71 | 211 | 289 | 211 | 211 | 211 | 211 | 211 | 211 |
| CBRATU3D | 54 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CBRATU3D | 128 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CBRATU3D | 686 | 250 | 42 | 42 | 0 | 0 | 36 | 54 | 31 | 31 | 33 | 4 | 4 | 4 | 13 | 42 | 35 | 42 | 35 | 35 | 35 | 35 | 35 |
| CBRATU3D | 2000 | 1024 | 70 | 95 | 0 | 0 | 81 | 118 | 71 | 71 | 70 | 3 | 3 | 3 | 22 | 71 | 82 | 75 | 70 | 70 | 70 | 70 | 70 |
| CHANDHEQ | 10 | 0 | 38 | 38 | 0 | 0 | 66 | 43 | 40 | 43 | 13 | 16 | 13 | 13 | 13 | 38 | 37 | 37 | 38 | 38 | 38 | 38 | 79 |
| CHANDHEQ | 50 | 0 | 48 | 51 | 0 | 0 | 98 | 39 | 39 | 45 | 48 | 17 | 13 | 13 | 13 | 48 | 49 | 48 | 51 | 50 | 51 | 50 | 102 |
| CHANDHEQ | 100 | 0 | 49 | 47 | 0 | 0 | 122 | 39 | 41 | 41 | 55 | 18 | 13 | 13 | 13 | 49 | 49 | 49 | 50 | 48 | 50 | 50 | 73 |
| CHEBYQAD | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| CHEBYQAD | 4 | 0 | 9 | 9 | 0 | 0 | 12 | 12 | 12 | 11 | 9 | 9 | 8 | 10 | 9 | 9 | 11 | 11 | 6 | 6 | 7 | 7 | 7 |
| CHEBYQAD | 5 | 0 | 9 | 14 | 0 | 0 | 12 | 10 | 12 | 13 | 9 | 11 | 9 | 8 | 9 | 8 | 8 | 9 | 6 | 6 | 6 | 6 | 7 |
| CHEBYQAD | 6 | 0 | 21 | 21 | 0 | 0 | 25 | 23 | 24 | 26 | 21 | 18 | 16 | 14 | 21 | 22 | 14 | 33 | 9 | 9 | 16 | 16 | 16 |
| CHEBYQAD | 7 | 0 | 25 | 35 | 0 | 0 | 23 | 24 | 24 | 33 | 16 | 23 | 17 | 14 | 24 | 27 | 21 | 40 | 30 | 30 | 26 | 26 | 26 |
| CHEBYQAD | 8 | 0 | 59 | 59 | 0 | 0 | 38 | 36 | 30 | 45 | 31 | 43 | 23 | 29 | 28 | 57 | 49 | 101 | 114 | 114 | 34 | 34 | 34 |
| CHEBYQAD | 9 | 0 | 76 | 99 | 0 | 0 | 30 | 33 | 36 | 47 | 24 | 27 | 24 | 27 | 18 | 75 | 64 | 80 | 100 | 100 | 68 | 68 | 67 |
| CHEBYQAD | 10 | 0 | 68 | 68 | ( 0) | 0 | ( 46) | ( 57) | ( 47) | ( 62) | 28 | 68 | 25 | 27 | 27 | 62 | 56 | ( 128) | 186 | 186 | 61 | 61 | 62 |
| CHEBYQAD | 20 | 0 | 145 | 145 | 0 | 0 | 172 | 293 | 110 | 176 | 98 | 198 | 53 | 44 | 54 | 142 | 148 | 358 | 391 | 399 | 141 | 141 | 134 |
| CHEBYQAD | 50 | 0 | 744 | 1126 | 0 | 0 | 441 | 512 | 367 | 775 | 782 | 268 | 259 | 139 | 307 | 761 | 626 | 763 | —I— | —I— | 568 | 562 | 619 |
| CHEMRCTA | 10 | 10 | 17 | 20 | 0 | 0 | 52 | 850 | 57 | 200 | 11 | 20 | 17 | 13 | 10 | 17 | 17 | 34 | 17 | 18 | 17 | 17 | 17 |
| CHEMRCTA | 50 | 50 | 201 | 236 | 0 | 0 | —F— | —F— | —F— | 30409 | 175 | 36 | 101 | 28 | —F— | 210 | 175 | 167 | 207 | 205 | 226 | 224 | 217 |
| CHEMRCTA | 100 | 100 | 694 | 429 | 0 | 0 | —F— | —F— | —F— | —S— | 674 | 83 | —F— | 52 | —F— | 636 | 625 | 935 | 611 | 681 | 543 | 598 | 606 |
| CHEMRCTA | 500 | 500 | —T— | —F— | —F— | —F— | —T— | —F— | —T— | —T— | —T— | 486 | —F— | 142 | —T— | —F— | —F— | —T— | —E— | —T— | —F— | —F— | —T— |
| CHEMRCTA | 1000 | 1000 | —T— | —F— | —F— | —F— | —T— | —T— | —T— | —T— | —T— | 922 | 1092 | 294 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTA | 5000 | 5000 | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTB | 10 | 10 | 8 | 8 | 0 | 0 | 89 | —F— | 224 | 564 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 13 | 15 | 9 | 15 | 15 | 15 |
| CHEMRCTB | 50 | 50 | 27 | 76 | 0 | —F— | —F— | —F— | —F— | 81348 | 27 | 26 | 35 | 26 | 86 | 27 | 22 | 35 | 28 | 25 | 28 | 28 | 28 |

Number of cg-iterations ( 3 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMRCTB | 100 | 100 | 27 | 42 | 0 | 0 | —F— | —F— | —F— | —S— | 27 | 42 | 42 | 42 | —F— | 27 | 37 | 37 | 35 | 38 | 35 | 35 | 35 |
| CHEMRCTB | 500 | 500 | 161 | 161 | 0 | —F— | —T— | —T— | —T— | —T— | 161 | 155 | 155 | 155 | —F— | 164 | 152 | 279 | 164 | 162 | 164 | 164 | 160 |
| CHEMRCTB | 1000 | 1000 | 300 | —S— | 0 | —F— | —T— | —T— | —T— | —T— | 300 | 298 | 323 | 298 | —F— | 302 | 305 | 472 | —S— | —S— | —S— | —S— | —S— |
| CHNROSNB | 10 | 0 | 29 | 32 | 0 | 0 | 167 | 133 | 130 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 31 | 32 | 35 | 35 | 27 | 27 | 27 |
| CHNROSNB | 25 | 0 | 44 | 39 | 0 | 0 | 297 | 3128 | 221 | 44 | 44 | 56 | 50 | 56 | 52 | 44 | 48 | 67 | 62 | 62 | 42 | 42 | 42 |
| CHNROSNB | 50 | 0 | 76 | 69 | 0 | 0 | 508 | 290 | 330 | 76 | 76 | 76 | 80 | 76 | 83 | 76 | 73 | 163 | 90 | 90 | 68 | 68 | 62 |
| CLIFF | 2 | 0 | 3 | 3 | 0 | 0 | 6 | —I— | 6 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEA | 16 | 0 | 3 | 3 | 0 | 0 | 19 | 20 | 16 | 17 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEA | 49 | 0 | 26 | 26 | 0 | 0 | 42 | 46 | 35 | 26 | 3 | 3 | 3 | 3 | 3 | 26 | 25 | 24 | 26 | 26 | 26 | 26 | 26 |
| CLPLATEA | 100 | 0 | 39 | 40 | 0 | 0 | 61 | 76 | 53 | 39 | 4 | 4 | 4 | 4 | 4 | 39 | 39 | 40 | 39 | 39 | 39 | 39 | 39 |
| CLPLATEA | 529 | 0 | 104 | 99 | 0 | 0 | 171 | 209 | 157 | 104 | 104 | 5 | 5 | 5 | 12 | 104 | 91 | 94 | 104 | 104 | 104 | 104 | 104 |
| CLPLATEA | 1024 | 0 | 143 | 137 | 0 | 0 | 220 | 303 | 157 | 143 | 143 | 5 | 5 | 5 | 24 | 143 | 133 | 168 | 143 | 143 | 143 | 143 | 143 |
| CLPLATEA | 5041 | 0 | 319 | 314 | 0 | 0 | 752 | 607 | 432 | 319 | 319 | 13 | 13 | 13 | 41 | 327 | 390 | 423 | 319 | 319 | 319 | 319 | 319 |
| CLPLATEB | 16 | 0 | 3 | 3 | 0 | 0 | 22 | 21 | 20 | 17 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| CLPLATEB | 49 | 0 | 23 | 34 | 0 | 0 | 34 | 30 | 30 | 23 | 2 | 2 | 2 | 2 | 3 | 23 | 23 | 23 | 23 | 23 | 23 | 23 | 23 |
| CLPLATEB | 100 | 0 | 34 | 50 | 0 | 0 | 50 | 46 | 44 | 34 | 2 | 2 | 2 | 2 | 3 | 34 | 34 | 34 | 34 | 34 | 34 | 34 | 34 |
| CLPLATEB | 529 | 0 | 76 | 107 | 0 | 0 | 113 | 111 | 102 | 76 | 76 | 2 | 2 | 2 | 10 | 76 | 90 | 76 | 76 | 76 | 76 | 76 | 76 |
| CLPLATEB | 1024 | 0 | 107 | 126 | 0 | 0 | 154 | 152 | 139 | 107 | 107 | 2 | 2 | 2 | 15 | 107 | 118 | 107 | 107 | 107 | 107 | 107 | 107 |
| CLPLATEB | 5041 | 0 | 214 | 340 | 0 | 0 | 326 | 318 | 299 | 214 | 214 | 2 | 2 | 2 | 26 | 214 | 263 | 214 | 214 | 214 | 214 | 214 | 214 |
| CLPLATEC | 16 | 0 | 2 | 2 | 0 | 0 | 24 | 24 | 23 | 29 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEC | 49 | 0 | 60 | 89 | 0 | 0 | 82 | 78 | 85 | 60 | 2 | 2 | 2 | 2 | 3 | 60 | 61 | 72 | 60 | 60 | 60 | 60 | 60 |
| CLPLATEC | 100 | 0 | 168 | 200 | 0 | 0 | 165 | 202 | 166 | 168 | 1 | 1 | 1 | 1 | 10 | 168 | 162 | 162 | 168 | 168 | 168 | 168 | 168 |
| CLPLATEC | 529 | 0 | 743 | 701 | 0 | 0 | 719 | 908 | 810 | 743 | 743 | 1 | 1 | 1 | 63 | 743 | 758 | 743 | 743 | 743 | 743 | 743 | 743 |
| CLPLATEC | 1024 | 0 | 1273 | 1279 | 0 | 0 | 1403 | 2465 | 1115 | 1273 | 1273 | 1 | 1 | 1 | 90 | 1273 | 1273 | 1273 | 1273 | 1273 | 1273 | 1273 | 1273 |
| CLPLATEC | 5041 | 0 | 3932 | 4032 | 0 | 0 | 5632 | 15127 | 4226 | 3932 | 3932 | 1 | 1 | 1 | 472 | 3932 | 6903 | 3932 | 3932 | 3932 | 3932 | 3932 | 3932 |
| CLUSTER | 2 | 2 | 9 | 9 | 0 | 0 | 7 | 3 | 7 | 9 | 9 | 7 | 9 | 9 | 5 | 10 | 10 | 7 | 7 | 9 | 8 | 6 | 6 |
| CORKSCRW | 96 | 70 | 636 | 614 | 0 | 0 | 638 | 761 | 587 | 669 | 278 | 205 | 184 | 90 | 215 | 682 | 581 | 1032 | 704 | 3940 | 599 | 843 | 701 |
| CORKSCRW | 456 | 350 | 76609 | 23227 | —I— | 0 | —T— | 152025 | 78307 | 83029 | 14146 | 5512 | 3279 | 1690 | 9830 | 71044 | 72785 | 71802 | 97475 | —I— | 77453 | 80626 | 78851 |
| CORKSCRW | 906 | 700 | —T— | 113552 | —I— | —I— | —T— | —I— | —T— | —T— | —S— | 7687 | —S— | 4337 | 20465 | —T— | —T— | —T— | —T— | —I— | —T— | —T— | —T— |
| CORKSCRW | 4506 | 3500 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CORKSCRW | 9006 | 7000 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CRAGGLVY | 4 | 0 | 14 | 19 | 0 | 0 | 50 | 62 | 49 | 14 | 14 | 25 | 14 | 14 | 14 | 16 | 18 | 16 | 14 | 14 | 14 | 14 | 14 |
| CRAGGLVY | 10 | 0 | 11 | 13 | 0 | 0 | 82 | 216 | 53 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 10 | 11 | 11 | 11 | 11 | 11 | 11 |
| CRAGGLVY | 50 | 0 | 11 | 13 | 0 | 0 | 121 | 194 | 70 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 11 | 11 | 11 | 12 | 11 | 11 | 11 |
| CRAGGLVY | 100 | 0 | 11 | 13 | 0 | 0 | 164 | 196 | 70 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 12 | 11 | 11 | 12 | 11 | 11 | 11 |
| CRAGGLVY | 500 | 0 | 11 | 14 | 0 | 0 | 166 | 176 | 68 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 12 | 11 | 11 | 12 | 11 | 11 | 11 |
| CRAGGLVY | 1000 | 0 | 11 | 14 | 0 | 0 | 166 | 156 | 71 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 12 | 11 | 12 | 12 | 12 | 12 | 17 |
| CRAGGLVY | 5000 | 0 | 12 | 15 | 0 | 0 | 166 | 118 | 68 | 12 | 12 | 12 | 12 | 12 | 13 | 12 | 14 | 12 | 12 | 12 | 12 | 12 | —S— |
| CUBE | 2 | 0 | 35 | 41 | 0 | 0 | 71 | 775 | 65 | 35 | 35 | 61 | 45 | 38 | 39 | 35 | 41 | 57 | 33 | 22 | 24 | 24 | 24 |
| DALLASL | 906 | 667 | 64893 | —T— | 0 | 0 | 177772 | —I— | 92082 | 112090 | 27521 | 1682 | 63 | 63 | 16144 | 45249 | 48561 | 59946 | 67111 | —I— | 62804 | 74410 | ( 66202) |
| DALLASM | 196 | 151 | 13763 | —I— | 0 | 0 | 169005 | —I— | 127379 | 58503 | 7568 | 486 | 43 | 43 | 7465 | 13172 | 13624 | 12585 | 13978 | —I— | 14124 | 14604 | 12680 |
| DALLASS | 46 | 31 | 3037 | —S— | 0 | 0 | 7646 | —I— | 6520 | 7098 | 5385 | 749 | 43 | 43 | 768 | 3680 | 3467 | 4114 | 3665 | —I— | 3799 | 4198 | 4447 |
| DEGENLPA | 20 | 15 | 136 | 84 | —I— | 0 | 3613 | —I— | 292 | 275 | 43 | 147 | 44 | 50 | 208 | —S— | 135 | —S— | 159 | —S— | 158 | 159 | 158 |
| DEGENLPB | 20 | 15 | —S— | —S— | —I— | 0 | 5503 | —I— | —S— | 373 | —S— | 130 | —S— | 35 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| DENSCHNA | 2 | 0 | 4 | 4 | 0 | 0 | 6 | 8 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| DENSCHNB | 2 | 0 | 2 | 2 | 0 | 0 | 3 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 3 | 0 | 0 | 0 | 0 | 0 |
| DENSCHNC | 2 | 0 | 4 | 10 | 0 | 0 | 8 | 8 | 8 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 5 | 5 |
| DENSCHND | 3 | 0 | 30 | 34 | 0 | 0 | 61 | —I— | 71 | 59 | 30 | 48 | 36 | 36 | 46 | 33 | 30 | 26 | 38 | —I— | 31 | 30 | 34 |
| DENSCHNE | 3 | 0 | 5 | —E— | 0 | 0 | 7 | 0 | 5 | 5 | 5 | 4 | 5 | 4 | 4 | 6 | 9 | 10 | 5 | 6 | 5 | 5 | 5 |
| DENSCHNF | 2 | 0 | 6 | 6 | 0 | 0 | 10 | 6 | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 4 | 4 | 4 |
| DIPIGRI | 7 | 4 | 283 | 333 | 0 | 0 | 165 | 1223 | 145 | 176 | 51 | 139 | 29 | 28 | 90 | 269 | 1130 | 374 | 350 | —I— | 217 | 302 | —I— |
| DISC2 | 29 | 23 | 660 | 865 | —I— | 0 | 1302 | 1571 | 670 | 911 | 864 | 593 | 293 | 100 | 467 | 722 | 674 | 1675 | 820 | —I— | 494 | 574 | 662 |
| DISCS | 36 | 66 | 28516 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —F— | ( 591) | —I— | ( 829) | —F— | —I— | —T— | 10299 | 7067 | 27867 | 27984 | —I— |
| DIXCHLNG | 10 | 5 | 44 | 56 | 0 | 0 | 91 | 1904 | 72 | ( 281) | 28 | 53 | 35 | 27 | 28 | 54 | 48 | 89 | 95 | —I— | 32 | 51 | ( 1835) |
| DIXCHLNV | 10 | 5 | 21 | 85 | 0 | 0 | 102 | 2832 | 67 | 22 | 10 | 18 | 12 | 13 | 12 | 30 | 28 | 25 | 29 | —I— | 29 | 14 | 33 |
| DIXMAANA | 15 | 0 | 4 | 4 | 0 | 0 | 8 | 2 | 8 | 8 | 4 | 8 | 3 | 5 | 4 | 4 | 5 | 5 | 8 | 0 | 4 | 5 | 14 |
| DIXMAANA | 90 | 0 | 9 | 9 | 0 | 0 | 9 | 2 | 9 | 9 | 9 | 8 | 4 | 5 | 4 | 9 | 3 | 9 | 8 | 0 | 14 | 5 | 0 |
| DIXMAANA | 300 | 0 | 9 | 9 | 0 | 0 | 9 | 2 | 9 | 9 | 9 | 8 | 4 | 5 | 5 | 9 | 4 | 13 | 10 | 0 | 15 | 6 | 0 |
| DIXMAANA | 1500 | 0 | 10 | 10 | 0 | 0 | 9 | 2 | 10 | 10 | 10 | 9 | 4 | 5 | 5 | 10 | 6 | 15 | 15 | 0 | 17 | 7 | 0 |

Number of cg-iterations ( 4 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXMAANA | 3000 | 0 | 10 | 10 | 0 | 0 | 8 | 2 | 10 | 10 | 10 | 9 | 4 | 5 | 5 | 10 | 7 | 15 | 15 | 0 | 17 | 7 | 0 |
| DIXMAANB | 15 | 0 | 5 | 5 | 0 | 0 | 13 | 3 | 5 | 9 | 5 | 6 | 5 | 5 | 4 | 5 | 6 | 21 | 6 | 0 | 17 | 4 | 14 |
| DIXMAANB | 90 | 0 | 10 | 10 | 0 | 0 | 14 | 2 | 6 | 10 | 10 | 7 | 5 | 6 | 6 | 10 | 7 | 85 | 8 | 0 | 16 | 7 | 10 |
| DIXMAANB | 300 | 0 | 6 | 6 | 0 | 0 | 13 | 2 | 6 | 6 | 6 | 8 | 6 | 6 | 7 | 6 | 9 | 342 | 8 | 0 | 18 | 8 | 10 |
| DIXMAANB | 1500 | 0 | 7 | 7 | 0 | 0 | 13 | 2 | 8 | 7 | 7 | 6 | 6 | 10 | 7 | 7 | 6 | 1744 | 8 | 0 | 17 | 7 | 10 |
| DIXMAANB | 3000 | 0 | 7 | 7 | 0 | 0 | 13 | 3 | 10 | 7 | 7 | 6 | 6 | 5 | 7 | 7 | 12 | 3495 | 8 | 0 | 18 | 7 | 10 |
| DIXMAANC | 15 | 0 | 6 | 6 | 0 | 0 | 14 | 3 | 9 | 6 | 6 | 8 | 6 | 7 | 7 | 7 | 9 | 26 | 9 | 0 | 24 | 8 | 27 |
| DIXMAANC | 90 | 0 | 7 | 7 | 0 | 0 | 14 | 3 | 9 | 7 | 7 | 8 | 8 | 8 | 7 | 8 | 11 | 123 | 10 | 0 | 43 | 9 | 10 |
| DIXMAANC | 300 | 0 | 9 | 9 | 0 | 0 | 15 | 3 | 9 | 9 | 9 | 9 | 7 | 7 | 8 | 11 | 10 | 405 | 10 | 0 | 44 | 10 | 10 |
| DIXMAANC | 1500 | 0 | 11 | 11 | 0 | 0 | 15 | 3 | 11 | 11 | 11 | 13 | 8 | 10 | 10 | 12 | 8 | 3487 | 10 | 0 | 37 | 9 | 10 |
| DIXMAANC | 3000 | 0 | 13 | 13 | 0 | 0 | 15 | 3 | 12 | 13 | 13 | 12 | 8 | 10 | 10 | 16 | 13 | 7487 | 11 | 0 | 47 | 10 | 10 |
| DIXMAAND | 15 | 0 | 7 | 13 | 0 | 0 | 17 | 6 | 10 | 12 | 7 | 12 | 8 | 9 | 9 | 7 | 6 | 42 | 11 | 0 | 40 | 10 | 28 |
| DIXMAAND | 90 | 0 | 11 | 24 | 0 | 0 | 17 | 6 | 12 | 11 | 11 | 10 | 11 | 7 | 9 | 12 | 10 | 223 | 17 | 0 | 62 | 14 | 25 |
| DIXMAAND | 300 | 0 | 10 | 27 | 0 | 0 | 18 | 5 | 12 | 10 | 10 | 11 | 10 | 12 | 17 | 11 | 14 | 747 | 18 | 0 | 63 | 14 | 25 |
| DIXMAAND | 1500 | 0 | 12 | 24 | 0 | 0 | 19 | 5 | 14 | 12 | 12 | 17 | 13 | 17 | 12 | 12 | 13 | 3751 | 22 | 0 | 77 | 14 | 25 |
| DIXMAAND | 3000 | 0 | 13 | 15 | 0 | 0 | 18 | 5 | 16 | 13 | 13 | 10 | 13 | 14 | 17 | 14 | 13 | 7505 | 24 | 0 | 72 | 13 | 25 |
| DIXMAANE | 15 | 0 | 6 | 10 | 0 | 0 | 29 | 16 | 9 | 9 | 6 | 8 | 5 | 7 | 5 | 6 | 6 | 28 | 8 | 0 | 17 | 8 | 22 |
| DIXMAANE | 90 | 0 | 10 | 16 | 0 | 0 | 61 | 24 | 10 | 10 | 10 | 9 | 5 | 7 | 5 | 10 | 20 | 156 | 25 | 0 | 206 | 15 | 40 |
| DIXMAANE | 300 | 0 | 10 | 16 | 0 | 0 | 109 | 24 | 10 | 10 | 10 | 9 | 6 | 7 | 5 | 10 | 12 | 495 | 43 | 0 | 324 | 20 | 100 |
| DIXMAANE | 1500 | 0 | 11 | 20 | 0 | 0 | 211 | 33 | 11 | 11 | 11 | 10 | 6 | 7 | 5 | 11 | 19 | 2454 | 57 | 0 | 358 | 26 | 209 |
| DIXMAANE | 3000 | 0 | 11 | 17 | 0 | 0 | 276 | 38 | 11 | 11 | 11 | 10 | 6 | 7 | 6 | 11 | 25 | 4896 | 78 | 0 | 409 | 26 | 263 |
| DIXMAANF | 15 | 0 | 10 | 6 | 0 | 0 | 33 | 7 | 12 | 9 | 10 | 8 | 8 | 9 | 8 | 11 | 8 | 34 | 10 | 0 | 41 | 9 | 29 |
| DIXMAANF | 90 | 0 | 11 | 20 | 0 | 0 | 70 | 10 | 19 | 11 | 11 | 14 | 10 | 14 | 10 | 11 | 21 | 191 | 20 | 0 | 223 | 17 | 24 |
| DIXMAANF | 300 | 0 | 21 | 16 | 0 | 0 | 114 | 17 | 24 | 21 | 21 | 16 | 19 | 15 | 17 | 13 | 18 | 742 | 23 | 0 | 375 | 17 | 70 |
| DIXMAANF | 1500 | 0 | 24 | 21 | 0 | 0 | 183 | 53 | 32 | 24 | 24 | 27 | 27 | 19 | 37 | 37 | 43 | 3713 | 37 | 0 | 429 | 26 | 254 |
| DIXMAANF | 3000 | 0 | 24 | 46 | 0 | 0 | 230 | 43 | 37 | 24 | 24 | 36 | 25 | 39 | 11 | 46 | 23 | 7464 | 34 | 0 | 62 | 21 | 446 |
| DIXMAANG | 15 | 0 | 11 | 13 | 0 | 0 | 38 | 9 | 11 | 10 | 11 | 11 | 13 | 12 | 14 | 11 | 9 | 47 | 13 | 0 | 47 | 11 | 26 |
| DIXMAANG | 90 | 0 | 17 | 29 | 0 | 0 | 71 | 11 | 18 | 17 | 17 | 12 | 13 | 12 | 15 | 13 | 11 | 252 | 21 | 0 | 202 | 21 | 43 |
| DIXMAANG | 300 | 0 | 24 | 44 | 0 | 0 | 110 | 16 | 20 | 24 | 24 | 15 | 29 | 15 | 40 | 17 | 37 | 845 | 25 | 0 | 504 | 30 | 124 |
| DIXMAANG | 1500 | 0 | 21 | 110 | 0 | 0 | 175 | 23 | 24 | 21 | 21 | 42 | 32 | 35 | 45 | 28 | 26 | 4102 | 34 | 0 | 506 | 25 | 483 |
| DIXMAANG | 3000 | 0 | 52 | 157 | 0 | 0 | 264 | 28 | 26 | 52 | 52 | 36 | 26 | 41 | 45 | 58 | 28 | 8254 | 36 | 0 | —I— | 46 | 845 |
| DIXMAANH | 15 | 0 | 13 | 18 | 0 | 0 | 36 | 9 | 14 | 11 | 13 | 15 | 10 | 14 | 10 | 12 | 12 | 43 | 13 | 0 | 63 | 14 | 38 |
| DIXMAANH | 90 | 0 | 21 | 28 | 0 | 0 | 72 | 12 | 22 | 21 | 21 | 16 | 16 | 17 | 26 | 13 | 23 | 266 | 37 | 0 | 310 | 20 | 66 |
| DIXMAANH | 300 | 0 | 24 | 37 | 0 | 0 | 130 | 18 | 23 | 24 | 24 | 26 | 25 | 29 | 33 | 30 | 18 | 881 | 40 | 0 | —I— | 25 | 184 |
| DIXMAANH | 1500 | 0 | 41 | 92 | 0 | 0 | 221 | 27 | 27 | 41 | 41 | 39 | 31 | 24 | 74 | 30 | 22 | 4544 | 43 | 0 | —I— | 34 | 674 |
| DIXMAANH | 3000 | 0 | 38 | 182 | 0 | —T— | 285 | 51 | 29 | 38 | 38 | 40 | 47 | 39 | 82 | 32 | 55 | 9095 | 93 | 0 | —I— | 45 | —I— |
| DIXMAANI | 15 | 0 | 6 | 21 | 0 | 0 | 55 | 23 | 9 | 9 | 6 | 9 | 5 | 6 | 6 | 6 | 7 | 25 | 10 | 0 | 51 | 13 | 29 |
| DIXMAANI | 90 | 0 | 9 | 23 | 0 | 0 | 286 | 27 | 9 | 9 | 9 | 8 | 5 | 6 | 6 | 9 | 15 | 192 | 54 | 0 | 367 | 20 | —I— |
| DIXMAANI | 300 | 0 | 9 | 21 | 0 | 0 | 962 | 31 | 9 | 9 | 9 | 8 | 5 | 7 | 10 | 9 | 23 | 612 | 65 | 0 | 691 | 22 | —I— |
| DIXMAANI | 1500 | 0 | 16 | 27 | 0 | 0 | 3023 | 45 | 9 | 16 | 16 | 8 | 5 | 8 | 25 | 16 | 39 | 3019 | 96 | 0 | 1497 | 27 | 1 |
| DIXMAANI | 3000 | 0 | 22 | 40 | 0 | 0 | 5633 | 63 | 9 | 22 | 22 | 8 | 6 | 8 | 45 | 22 | 23 | 6033 | 157 | 0 | 1757 | 37 | 1 |
| DIXMAANJ | 15 | 0 | 12 | 0 | 0 | 0 | 72 | 14 | 12 | 14 | 12 | 13 | 16 | 16 | 6 | 12 | 11 | 44 | 16 | 0 | 332 | 14 | 34 |
| DIXMAANJ | 90 | 0 | 22 | 0 | 0 | 0 | 284 | 40 | 17 | 22 | 22 | 16 | 18 | 28 | 25 | 22 | 35 | 255 | 31 | 0 | 358 | 23 | 610 |
| DIXMAANJ | 300 | 0 | 22 | 0 | 0 | 0 | 669 | 69 | 28 | 22 | 22 | 40 | 33 | 28 | 43 | 36 | 16 | 795 | 35 | 0 | 236 | 53 | —I— |
| DIXMAANJ | 1500 | 0 | 44 | 0 | 0 | 0 | 3069 | 82 | 45 | 37 | 44 | 67 | 38 | 51 | 137 | 41 | 56 | 4482 | 53 | 0 | 305 | 50 | 1 |
| DIXMAANJ | 3000 | 0 | 61 | 0 | 0 | —T— | 4083 | 85 | 29 | 52 | 56 | 82 | 52 | 52 | 63 | 41 | 81 | 9456 | 114 | 0 | 165 | 47 | 1 |
| DIXMAANK | 15 | 0 | 16 | 23 | 0 | 0 | 54 | 16 | 18 | 11 | 16 | 21 | 11 | 16 | 10 | 17 | 16 | 50 | 16 | 0 | 138 | 12 | 49 |
| DIXMAANK | 90 | 0 | 19 | 149 | 0 | 0 | 200 | 63 | 31 | 19 | 19 | 24 | 18 | 19 | 29 | 28 | 23 | 320 | 37 | 0 | 308 | 28 | —I— |
| DIXMAANK | 300 | 0 | 25 | 109 | 0 | 0 | 564 | 71 | 20 | 25 | 25 | 42 | 40 | 35 | 49 | 39 | 27 | 1177 | 36 | 0 | 307 | 34 | —I— |
| DIXMAANK | 1500 | 0 | 48 | 243 | 0 | 0 | 1838 | 77 | 36 | 49 | 47 | 59 | 54 | 74 | 251 | 38 | 80 | 5734 | 67 | 0 | 346 | 52 | 1 |
| DIXMAANK | 3000 | 0 | 37 | 250 | 0 | —T— | 3073 | 88 | 47 | 35 | 37 | 63 | 33 | 65 | 684 | 55 | 157 | 10888 | 95 | 0 | 218 | 51 | 1 |
| DIXMAANL | 15 | 0 | 14 | 24 | 0 | 0 | 57 | 15 | 18 | 11 | 14 | 12 | 13 | 16 | 12 | 16 | 10 | 54 | 20 | 0 | 124 | 19 | 35 |
| DIXMAANL | 90 | 0 | 46 | 62 | 0 | 0 | 221 | 38 | 14 | 46 | 46 | 31 | 37 | 31 | 17 | 25 | 39 | 380 | 54 | —I— | 449 | 27 | —I— |
| DIXMAANL | 300 | 0 | 38 | 96 | 0 | 0 | 980 | 101 | 28 | 38 | 38 | 43 | 54 | 52 | 69 | 45 | 45 | 1235 | 42 | —E— | 874 | 42 | —I— |
| DIXMAANL | 1500 | 0 | 67 | 184 | 0 | 0 | 1344 | 82 | 52 | 59 | 67 | 79 | 42 | 71 | 596 | 86 | 59 | 5988 | 111 | —T— | 382 | 59 | 1 |
| DIXMAANL | 3000 | 0 | 69 | 161 | 0 | —T— | 3071 | 81 | 39 | 70 | 69 | 76 | 81 | 78 | 1304 | 130 | 413 | 14506 | 170 | —T— | 365 | 55 | 1 |
| DIXON3DQ | 10 | 0 | 2 | 2 | 0 | 0 | 24 | 25 | 22 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 50 | 0 | 2 | 2 | 0 | 0 | 69 | 155 | 129 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 100 | 0 | 2 | 2 | 0 | 0 | 216 | 310 | 255 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |

Number of cg-iterations ( 5 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXON3DQ | 500 | 0 | 2 | 2 | 0 | 0 | 776 | 1341 | 839 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 1000 | 0 | 2 | 2 | 0 | 0 | 1427 | 2672 | 2104 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 6 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 5000 | 0 | 2 | 2 | 0 | 0 | 7487 | 12518 | 6766 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 10 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 50 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 100 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 500 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 1000 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 5000 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQRTIC | 10 | 0 | 15 | 18 | 0 | 0 | 28 | 0 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 17 | 17 | 15 | 15 | 15 | 15 | 15 | 15 |
| DQRTIC | 50 | 0 | 20 | 27 | 0 | 0 | 57 | —I— | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 22 | 24 | 20 | 20 | 20 | 20 | 20 | 20 |
| DQRTIC | 100 | 0 | 21 | 41 | 0 | 0 | 90 | —I— | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 23 | 25 | 21 | 21 | 21 | 21 | 21 | 21 |
| DQRTIC | 500 | 0 | 26 | 125 | 0 | 0 | 162 | —I— | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 27 | 31 | 26 | 26 | 26 | 26 | 26 | 26 |
| DQRTIC | 1000 | 0 | 27 | 278 | 0 | 0 | 223 | —I— | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 28 | 33 | 27 | 27 | 27 | 27 | 27 | 27 |
| DQRTIC | 5000 | 0 | 31 | 1559 | 0 | 0 | 368 | —I— | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 33 | 42 | 31 | 31 | 31 | 31 | 31 | 31 |
| EDENSCH | 36 | 0 | 9 | 10 | 0 | 0 | 33 | 13 | 19 | 9 | 9 | 10 | 9 | 10 | 10 | 10 | 14 | 9 | 38 | —I— | 14 | 11 | 11 |
| EDENSCH | 2000 | 0 | 9 | 10 | 0 | 0 | 36 | 8 | 22 | 9 | 9 | 8 | 8 | 8 | 10 | 10 | 13 | 9 | 49 | —I— | 12 | 11 | 11 |
| ENGVAL1 | 2 | 0 | 5 | 5 | 0 | 0 | 10 | 4 | 6 | 5 | 5 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 16 | 5 | 5 | 5 |
| ENGVAL1 | 50 | 0 | 7 | 7 | 0 | 0 | 20 | 11 | 14 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 8 | 7 | 7 | 25 | 7 | 7 | 7 |
| ENGVAL1 | 100 | 0 | 7 | 7 | 0 | 0 | 20 | 9 | 14 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 7 | 7 | 26 | 7 | 7 | 7 |
| ENGVAL1 | 1000 | 0 | 7 | 8 | 0 | 0 | 20 | 8 | 13 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 10 | 7 | 7 | 26 | 7 | 7 | 7 |
| ENGVAL1 | 5000 | 0 | 7 | 8 | 0 | 0 | 20 | 8 | 14 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 9 | 7 | 7 | —S— | 7 | 7 | 7 |
| ENGVAL2 | 3 | 0 | 14 | 14 | 0 | 0 | 30 | 79 | 37 | 31 | 14 | 33 | 15 | 14 | 15 | 19 | 16 | 13 | 15 | 11 | 15 | 16 | 14 |
| ERRINBAR | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| ERRINROS | 10 | 0 | 55 | —S— | 0 | 0 | 446 | ( 314) | 207 | 55 | 55 | 46 | 46 | 46 | 45 | 55 | 53 | 87 | 128 | 128 | 32 | 32 | 45 |
| ERRINROS | 25 | 0 | 50 | 73 | 0 | 0 | 630 | ( 213) | 283 | 50 | 50 | 51 | 42 | 51 | 60 | 60 | 50 | 123 | 117 | 117 | 37 | 37 | 85 |
| ERRINROS | 50 | 0 | 73 | 61 | 0 | 0 | 804 | ( 350) | 268 | 73 | 73 | 59 | 62 | 59 | 45 | 73 | 70 | 144 | 106 | 106 | 44 | 44 | 149 |
| EXPFIT | 2 | 0 | 7 | 7 | —E— | —E— | 12 | —E— | 11 | 7 | 7 | 10 | 7 | 10 | 7 | 10 | 11 | 8 | 8 | —I— | 3 | 10 | 10 |
| EXPFITA | 5 | 22 | 203 | 286 | —I— | 0 | 685 | 2898 | 217 | 327 | 343 | 243 | 21 | 22 | 188 | 202 | 254 | 216 | 660 | —I— | 918 | 785 | 733 |
| EXPFITB | 5 | 102 | 891 | 713 | —I— | 0 | 1904 | 5565 | 851 | 1012 | 898 | 305 | 51 | 50 | 372 | 848 | 1991 | 895 | 1492 | —I— | 2455 | 1141 | 2023 |
| EXPFITC | 5 | 502 | 1770 | —S— | —T— | 0 | 5142 | —I— | 2263 | 2149 | 1758 | 1193 | 179 | 188 | 880 | 1611 | 4982 | 1940 | 2862 | —I— | 5005 | 2430 | —I— |
| EXTROSNB | 5 | 0 | 62 | 63 | 0 | 0 | 315 | 812 | 329 | 62 | 62 | 62 | 62 | 62 | 62 | 62 | 70 | 87 | 77 | 77 | 63 | 63 | 63 |
| EXTROSNB | 10 | 0 | 700 | 642 | 0 | 0 | 3029 | —I— | 3902 | 700 | 700 | 491 | 491 | 491 | 491 | 700 | 661 | 829 | 962 | 962 | 661 | 661 | 661 |
| FREUROTH | 2 | 0 | 5 | 5 | 0 | 0 | 12 | 46 | 10 | 5 | 5 | 8 | 5 | 5 | 5 | 6 | 7 | 9 | 13 | 23 | 7 | 7 | 7 |
| FREUROTH | 10 | 0 | 6 | 5 | 0 | 0 | 27 | 44 | 14 | 6 | 6 | 6 | 7 | 6 | 6 | 10 | 9 | 9 | 15 | 36 | 10 | 10 | 10 |
| FREUROTH | 50 | 0 | 7 | 5 | 0 | 0 | 28 | 32 | 14 | 7 | 7 | 7 | 8 | 7 | 8 | 7 | 6 | 10 | 16 | 35 | 8 | 8 | —I— |
| FREUROTH | 100 | 0 | 7 | 5 | 0 | 0 | 28 | 31 | 14 | 7 | 7 | 7 | 8 | 7 | 8 | 7 | 5 | 9 | 16 | 40 | 8 | 8 | —I— |
| FREUROTH | 500 | 0 | 7 | 5 | 0 | 0 | 28 | 31 | —S— | 7 | 7 | 7 | 8 | 7 | 8 | 8 | 8 | 9 | —S— | —S— | 8 | 8 | 24 |
| FREUROTH | 1000 | 0 | 7 | 5 | 0 | 0 | —S— | 31 | —S— | 7 | 7 | 7 | 8 | 7 | 8 | 8 | 10 | 9 | 16 | —S— | 8 | 8 | —S— |
| FREUROTH | 5000 | 0 | 7 | 5 | 0 | 0 | 28 | 31 | —S— | 7 | 7 | 7 | 8 | 7 | 8 | 8 | —S— | 9 | —S— | —S— | 8 | 8 | —S— |
| GAUSSELM | 14 | 11 | 99 | —E— | 0 | ( 0) | ( 37) | ( 117) | ( 132) | ( 112) | ( 80) | 158 | 55 | ( 40) | 64 | 122 | 161 | 167 | 340 | —I— | 127 | 105 | 105 |
| GAUSSELM | 506 | 1135 | —T— | —E— | —I— | ( 0) | ( 1422) | —I— | 41856 | ( 61879) | —T— | —I— | ( 5820) | ( 3534) | ( 7123) | ( 62826) | ( 47642) | —T— | —I— | —I— | ( 56103) | ( 41055) | ( 30170) |
| GAUSSELM | 650 | 1496 | —T— | —E— | —I— | ( 0) | ( 1715) | —I— | —T— | 30669 | ( 22923) | —I— | ( 3177) | ( 5299) | ( 9943) | ( 50059) | —T— | —T— | —I— | —I— | —T— | —T— | ( 26439) |
| GOTTFR | 2 | 0 | 25 | 25 | 0 | 0 | 21 | 726 | 17 | 25 | 25 | 24 | 12 | 11 | 10 | 27 | 23 | 18 | 9 | 7 | 12 | 11 | 11 |
| GRIDNETA | 60 | 36 | 320 | 650 | 0 | 0 | 431 | 515 | 472 | 518 | 10 | 10 | 10 | 10 | 116 | 309 | 329 | 272 | 325 | 4876 | 311 | 325 | 330 |
| GRIDNETA | 180 | 100 | 767 | 1668 | 0 | 0 | 902 | 1120 | 900 | 1060 | 913 | 13 | 13 | 13 | 335 | 736 | 726 | 739 | 760 | 7084 | 758 | 760 | 760 |
| GRIDNETA | 612 | 324 | 1289 | 3835 | 0 | 0 | 2350 | 2653 | 1911 | 2164 | 1289 | 12 | 12 | 12 | 774 | 1280 | 1383 | 1382 | 1302 | 10661 | 1325 | 1302 | 1340 |
| GRIDNETA | 924 | 484 | 2801 | 7802 | 0 | 0 | 4159 | 4702 | 3780 | 4518 | 2801 | 23 | 23 | 23 | 1734 | 2892 | 2757 | 2865 | 2843 | 17711 | 2849 | 2843 | 2889 |
| GRIDNETA | 3444 | 1764 | 3680 | 10036 | —I— | 0 | 6740 | 7029 | 5444 | 6120 | 3680 | 25 | 25 | 25 | 2250 | 3707 | 3771 | 3847 | 3776 | 19405 | 3777 | 3775 | 3874 |
| GRIDNETA | 7564 | 3844 | 17260 | —T— | —I— | 0 | —T— | —T— | —T— | —T— | —T— | 52 | 52 | 52 | —T— | 17048 | —T— | —T— | 17517 | —T— | —T— | 17517 | —T— |
| GRIDNETA | 13284 | 6724 | —T— | —T— | —I— | 0 | —T— | —T— | —T— | —T— | —T— | 79 | 79 | 79 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETB | 60 | 36 | 288 | 288 | 0 | 0 | 203 | 283 | 196 | 401 | 542 | 6 | 6 | 6 | 121 | 316 | 298 | 314 | 290 | —I— | 290 | 290 | 320 |
| GRIDNETB | 180 | 100 | 483 | 483 | 0 | 0 | 660 | 923 | 594 | 858 | 566 | 7 | 7 | 7 | 617 | 471 | 510 | 483 | 500 | —I— | 493 | 500 | 484 |
| GRIDNETB | 612 | 324 | 998 | 998 | 0 | 0 | 1621 | 2244 | 1522 | 1608 | 998 | 7 | 7 | 7 | 1119 | 986 | 951 | 986 | 1015 | —I— | 981 | 1031 | 1049 |
| GRIDNETB | 924 | 484 | 1403 | 1403 | 0 | 0 | 2418 | 3168 | 2140 | 2252 | 1403 | 8 | 8 | 8 | 1690 | 1453 | 1385 | 1430 | 1411 | —I— | 1461 | 1421 | 1447 |
| GRIDNETB | 3444 | 1764 | 3309 | 3309 | 0 | 0 | 5469 | 6048 | 4105 | 4601 | 3309 | 8 | 8 | 8 | 3092 | 3309 | 3208 | 3360 | 3257 | —I— | 3275 | 3298 | 3210 |
| GRIDNETB | 7564 | 3844 | 5255 | 5255 | 0 | 0 | 8155 | 8382 | 5986 | 6826 | 5255 | 8 | 8 | 8 | 4890 | 5077 | 5370 | 5176 | 5274 | —I— | 5318 | 5193 | 5313 |
| GRIDNETB | 13284 | 6724 | 6864 | 6864 | 0 | 0 | 10162 | 11300 | 7486 | 8135 | —T— | 8 | 8 | 8 | 6373 | 6807 | 6924 | 6824 | 6796 | —I— | 6906 | 6977 | 6875 |
| GRIDNETC | 60 | 36 | 333 | 1042 | 0 | 0 | 475 | 468 | 412 | 493 | 386 | 11 | 11 | 11 | 101 | 301 | 391 | 343 | 350 | —I— | 360 | 350 | 359 |

Number of cg-iterations ( 6 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRIDNETC | 180 | 100 | 692 | 1643 | 0 | 0 | 1108 | 1348 | 903 | 970 | 774 | 21 | 21 | 21 | 651 | 746 | 699 | 679 | 759 | —I— | 752 | 731 | 696 |
| GRIDNETC | 612 | 324 | 1731 | 4350 | —I— | 0 | 3150 | 3588 | 2808 | 2294 | 1731 | 104 | 104 | 104 | 1528 | 1698 | 1768 | 1723 | 1774 | —I— | 1633 | 1774 | 1712 |
| GRIDNETC | 924 | 484 | 2339 | 5880 | —I— | 0 | 3917 | 4508 | 3125 | 2940 | 2339 | 131 | 131 | 131 | 2108 | 2362 | 2320 | 2413 | 2277 | —I— | 2298 | 2277 | 2342 |
| GRIDNETC | 3444 | 1764 | 8358 | 20833 | —I— | 0 | 12700 | 14813 | 10364 | 10087 | 8358 | 565 | 565 | 565 | 6293 | 8206 | 9211 | 7903 | 8433 | —I— | 8022 | 8537 | 8259 |
| GRIDNETC | 7564 | 3844 | —T— | —T— | —I— | 0 | —T— | —T— | —T— | —T— | —T— | 1908 | 1908 | 1908 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETD | 60 | 36 | 299 | 896 | 0 | 0 | 462 | 591 | 466 | 467 | 10 | 11 | 10 | 10 | 85 | 321 | 313 | 317 | 331 | 4062 | 308 | 343 | 1267 |
| GRIDNETD | 180 | 100 | 735 | 2208 | 0 | 0 | 1059 | 1091 | 932 | 1066 | 882 | 13 | 11 | 11 | 325 | 708 | 689 | 720 | 780 | 4910 | 777 | 738 | 2342 |
| GRIDNETD | 612 | 324 | 1271 | 5197 | 0 | 0 | 2166 | 2594 | 1793 | 2027 | 1271 | 13 | 12 | 12 | 856 | 1262 | 1315 | 1311 | 1294 | 8034 | 1258 | 1320 | 3906 |
| GRIDNETD | 924 | 484 | 2764 | 12726 | 0 | 0 | 4965 | 5115 | 3983 | 4247 | 2764 | 24 | 23 | 23 | 2001 | 2794 | 2786 | 2751 | 2812 | 14648 | 2845 | 2963 | 9646 |
| GRIDNETD | 3444 | 1764 | 4244 | 17878 | —I— | 0 | 7376 | 7737 | 5486 | 6193 | 4244 | 35 | 33 | 33 | 2580 | 3860 | 4089 | —S— | 4115 | 17046 | 4023 | 4453 | 11013 |
| GRIDNETD | 7564 | 3844 | —T— | —T— | —T— | 0 | —T— | —T— | —T— | —T— | —T— | 100 | 98 | 98 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETE | 60 | 36 | 301 | 301 | 0 | 0 | 273 | 364 | 265 | 383 | 543 | 7 | 7 | 7 | 137 | 321 | 294 | 289 | 306 | —I— | 298 | 311 | 2857 |
| GRIDNETE | 180 | 100 | 459 | 459 | 0 | 0 | 809 | 1078 | 705 | 826 | 543 | 8 | 8 | 8 | 566 | 447 | 449 | 465 | 458 | —I— | 448 | 580 | —I— |
| GRIDNETE | 612 | 324 | 905 | 905 | 0 | 0 | 1670 | 2242 | 1463 | 1542 | 905 | 8 | 8 | 8 | 1209 | 885 | 869 | 884 | 937 | —I— | 918 | 1019 | —I— |
| GRIDNETE | 924 | 484 | 1239 | 1239 | 0 | 0 | 2415 | 2880 | 2070 | 2065 | 1239 | 9 | 9 | 9 | 1347 | 1251 | 1246 | 1222 | 1230 | —I— | 1242 | 1820 | —I— |
| GRIDNETE | 3444 | 1764 | 2880 | 2880 | 0 | 0 | 5019 | 5517 | 3854 | 4218 | 2880 | 11 | 11 | 11 | 3236 | 2864 | 3027 | 2935 | 2952 | —I— | 2976 | 3677 | —I— |
| GRIDNETE | 7564 | 3844 | 4479 | 4479 | 0 | 0 | 7250 | 8436 | 5539 | 5978 | 4479 | 11 | 11 | 11 | 4954 | 4547 | 4494 | 4534 | 4535 | —I— | 4495 | 4567 | —I— |
| GRIDNETF | 60 | 36 | 303 | 897 | 0 | 0 | 398 | 431 | 415 | 463 | 423 | 11 | 10 | 10 | 114 | 320 | 357 | 311 | 333 | —I— | 309 | 321 | 1874 |
| GRIDNETF | 180 | 100 | 666 | 2087 | 0 | 0 | 1153 | 1412 | 1009 | 1026 | 696 | 23 | 22 | 22 | 614 | 677 | 656 | 655 | 726 | —I— | 657 | 819 | 6685 |
| GRIDNETF | 612 | 324 | 1398 | 4096 | —I— | 0 | 2614 | 3029 | 2382 | 2127 | 1398 | 70 | 67 | 67 | 1304 | 1434 | 1537 | 1506 | 1408 | —I— | 1420 | 2160 | 5902 |
| GRIDNETF | 924 | 484 | 2057 | 10370 | —I— | 0 | 3636 | 4424 | 3289 | 2872 | 2057 | 115 | 116 | 116 | 1868 | 2118 | 2170 | 2092 | 2127 | —I— | 2120 | 3487 | —I— |
| GRIDNETF | 3444 | 1764 | 7181 | 20450 | —I— | 0 | 11372 | 13132 | 9267 | 8755 | 7181 | 433 | 429 | 429 | 5398 | 6999 | 8233 | 6452 | 7526 | —I— | 7079 | 12959 | —I— |
| GRIDNETF | 7564 | 3844 | —T— | —T— | —T— | 0 | —T— | —T— | —T— | —T— | —T— | 1585 | 1587 | 1587 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETG | 60 | 36 | 292 | 349 | 0 | 0 | 454 | 696 | 471 | 498 | 9 | 9 | 8 | 8 | 115 | 290 | 308 | 291 | 307 | 3651 | 334 | 303 | 302 |
| GRIDNETH | 60 | 36 | 323 | 323 | 0 | 0 | 335 | 378 | 299 | 446 | 545 | 8 | 7 | 7 | 102 | 335 | 320 | 325 | 335 | —I— | 301 | 304 | 306 |
| GRIDNETI | 60 | 36 | 299 | 299 | 0 | 0 | 436 | 520 | 425 | 469 | 436 | 11 | 10 | 10 | 97 | 326 | 363 | 319 | 337 | 4727 | 318 | 305 | 305 |
| GULF | 3 | 0 | 32 | 35 | 0 | 0 | 84 | —E— | 87 | 109 | 32 | 76 | 47 | 38 | 52 | 33 | 39 | 58 | 244 | —I— | 40 | 35 | 38 |
| HAGER1 | 21 | 10 | 14 | 15 | 0 | 0 | 74 | 431 | 95 | 14 | 84 | 30 | 4 | 4 | 4 | 14 | 15 | 17 | 14 | 14 | 14 | 14 | 14 |
| HAGER1 | 101 | 50 | 17 | 16 | 0 | 0 | 261 | 6234 | 1224 | 17 | 17 | 14 | 3 | 3 | 7 | 17 | 14 | 14 | 17 | 17 | 17 | 17 | 17 |
| HAGER1 | 201 | 100 | 18 | 18 | 0 | 0 | 521 | —I— | 2686 | 18 | 18 | 15 | 3 | 3 | 504 | 18 | 14 | 14 | 18 | 18 | 18 | 18 | 18 |
| HAGER1 | 1001 | 500 | 20 | 13 | 0 | 0 | 3972 | —I— | 21228 | 20 | 20 | 17 | 3 | 3 | 634 | 20 | 17 | 14 | 20 | 20 | 20 | 20 | 20 |
| HAGER1 | 2001 | 1000 | 20 | 14 | 0 | 0 | 5121 | —I— | 43667 | 20 | 20 | 23 | 3 | 3 | 500 | 20 | 16 | 14 | 20 | 20 | 20 | 20 | 20 |
| HAGER1 | 10001 | 5000 | 19 | 10 | —M— | —T— | —T— | —T— | —T— | 19 | 19 | 17 | 56 | —M— | 418 | 19 | 31 | 17 | 19 | 19 | 19 | 19 | 19 |
| HAGER2 | 21 | 10 | 15 | 34 | 0 | 0 | 53 | 410 | 109 | 15 | 65 | 27 | 5 | 5 | 5 | 15 | 16 | 19 | 15 | 48 | 15 | 15 | 15 |
| HAGER2 | 101 | 50 | 18 | 38 | 0 | 0 | 261 | 5775 | 1114 | 18 | 18 | 72 | 3 | 3 | 7 | 18 | 19 | 19 | 16 | 44 | 16 | 16 | 16 |
| HAGER2 | 201 | 100 | 18 | 36 | 0 | 0 | 409 | —I— | 2474 | 18 | 18 | 100 | 4 | 4 | 514 | 18 | 21 | 19 | 15 | 38 | 15 | 15 | 15 |
| HAGER2 | 1001 | 500 | 19 | 37 | 0 | 0 | 2622 | —I— | 26048 | 19 | 19 | 960 | 4 | 4 | 594 | 19 | 21 | 17 | 16 | 41 | 16 | 16 | 16 |
| HAGER2 | 2001 | 1000 | 18 | 19 | —T— | 0 | 4122 | —I— | 42684 | 18 | 18 | —T— | 4 | —T— | 593 | 18 | 20 | 1030 | 21 | 26 | 21 | 21 | 21 |
| HAGER2 | 10001 | 5000 | 20 | —S— | —M— | —I— | —T— | —T— | —T— | 20 | 20 | —E— | 42 | —M— | 380 | 20 | 42 | 5487 | 15 | ( 18) | 15 | 15 | 15 |
| HAGER3 | 21 | 10 | 16 | 34 | 0 | 0 | 65 | 457 | 103 | 16 | 73 | 69 | 3 | 3 | 3 | 16 | 17 | 16 | 31 | 41 | 26 | 20 | 20 |
| HAGER3 | 101 | 50 | 17 | 55 | 0 | 0 | 211 | 6896 | 1067 | 17 | 17 | 154 | 4 | 4 | 8 | 17 | 21 | 15 | 25 | 48 | 26 | 21 | 21 |
| HAGER3 | 201 | 100 | 18 | 41 | 0 | 0 | 410 | —I— | 3194 | 18 | 18 | 241 | 4 | 4 | 442 | 18 | 20 | 16 | 32 | 28 | 27 | 18 | 21 |
| HAGER3 | 1001 | 500 | 20 | 40 | 0 | 0 | 2804 | —I— | 23857 | 20 | 20 | 3143 | 4 | 4 | 624 | 20 | 19 | 15 | 25 | 51 | 18 | 20 | 20 |
| HAGER3 | 2001 | 1000 | 20 | 20 | —T— | 0 | 4963 | —I— | 51003 | 20 | 20 | —T— | 4 | —T— | 671 | 20 | 14 | 17 | 71 | 445 | 21 | 22 | 22 |
| HAGER3 | 10001 | 5000 | 13 | —S— | —M— | —I— | —T— | —T— | —T— | 13 | 13 | —M— | 47 | —M— | 370 | 13 | 31 | 14 | 19 | 785 | 15 | 13 | 13 |
| HAGER4 | 21 | 10 | 36 | 63 | 0 | 0 | 117 | 1474 | 187 | 34 | 12 | 23 | 11 | 11 | 11 | 34 | 19 | 17 | 30 | 33 | 32 | 26 | 40 |
| HAGER4 | 101 | 50 | 90 | 109 | 0 | 0 | 917 | —I— | 4003 | 90 | 90 | 75 | 31 | 30 | 94 | 103 | 96 | 63 | 126 | 240 | 118 | 120 | 228 |
| HAGER4 | 201 | 100 | 165 | 205 | 0 | 0 | 2457 | —I— | 16848 | 165 | 165 | 148 | 56 | 55 | 478 | 185 | 171 | 95 | 216 | 290 | 218 | 204 | 400 |
| HAGER4 | 1001 | 500 | 1029 | 1166 | —T— | 0 | 58599 | —I— | —T— | 1029 | 1029 | 745 | 508 | 507 | 7019 | 1115 | 1039 | 901 | 1106 | 1841 | 1128 | 1086 | 1490 |
| HAGER4 | 2001 | 1000 | 2281 | 2737 | —T— | 0 | —T— | —I— | —T— | 2281 | 2281 | 1682 | 1006 | —T— | 16087 | 2319 | 2277 | 2267 | 2367 | 4266 | 2504 | 2299 | 4197 |
| HAGER4 | 10001 | 5000 | —T— | —T— | —M— | —T— | —T— | —I— | —T— | 8132 | —T— | —T— | 6995 | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| HAIRY | 2 | 0 | 61 | 92 | 0 | 0 | 98 | 51 | 112 | 61 | 61 | 85 | 58 | 60 | 52 | 85 | 83 | 67 | 57 | —S— | 69 | 54 | 53 |
| HATFLDA | 4 | 0 | 17 | 17 | 0 | 0 | 70 | 101 | 59 | 17 | 17 | 38 | 17 | 24 | 16 | 18 | 18 | 18 | 16 | 16 | 16 | 16 | 16 |
| HATFLDB | 4 | 0 | 15 | 15 | 0 | 0 | 52 | 85 | 43 | 15 | 15 | 37 | 15 | 17 | 14 | 15 | 15 | 14 | 10 | 10 | 14 | 14 | 14 |
| HATFLDC | 25 | 0 | 4 | 4 | 0 | 0 | 29 | 30 | 21 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 4 |
| HATFLDD | 3 | 0 | 18 | 18 | 0 | 0 | 34 | 65 | 43 | 28 | 18 | 26 | 10 | 13 | 27 | 20 | 30 | 33 | 30 | —I— | 17 | 22 | 19 |
| HATFLDE | 3 | 0 | 21 | 21 | 0 | 0 | 35 | 48 | 42 | 34 | 21 | 28 | 11 | 14 | 24 | 21 | 19 | 24 | 28 | —I— | 37 | 23 | 15 |
| HATFLDF | 3 | 0 | 25 | 86 | 0 | 0 | 157 | 48 | 20 | 55 | 25 | 41 | 38 | 43 | 29 | 28 | 22 | 60 | 29 | —I— | 25 | 14 | 14 |
| HATFLDG | 25 | 0 | 31 | 31 | 0 | 0 | 63 | 40 | 53 | 48 | 28 | 18 | 13 | 11 | 15 | 31 | 27 | 49 | 36 | —I— | 27 | 29 | 29 |

Number of cg-iterations ( 7 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HATFLDH | 4 | 7 | 53 | 53 | 0 | 0 | 77 | 96 | 92 | 108 | 16 | 75 | 19 | 18 | 19 | 51 | 52 | 62 | 231 | —I— | 84 | 52 | 60 |
| HELIX | 3 | 0 | 11 | —S— | 0 | 0 | 32 | 76 | 24 | 25 | 11 | 21 | 11 | 13 | 11 | 13 | 14 | 14 | 20 | —I— | 19 | 18 | 18 |
| HILBERTA | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 18 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTB | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTB | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTB | 50 | 0 | 0 | 6 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBA | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBB | 2 | 0 | 3 | 3 | 0 | 0 | 2 | 33 | 3 | 3 | 3 | 8 | 7 | 8 | 4 | 3 | 4 | 3 | 0 | 0 | 7 | 5 | 5 |
| HIMMELBC | 2 | 0 | 5 | 5 | 0 | 0 | 9 | 6 | 9 | 5 | 5 | 8 | 5 | 5 | 5 | 10 | 7 | 6 | 5 | 4 | 5 | 5 | 5 |
| HIMMELBD | 2 | 0 | 19 | 23 | 0 | 0 | 42 | —I— | 40 | 19 | 19 | 39 | 19 | 19 | 19 | —S— | 28 | 37 | 21 | —S— | 21 | 21 | 22 |
| HIMMELBE | 3 | 0 | 2 | 2 | 0 | 0 | 9 | 8 | 8 | 9 | 2 | 7 | 2 | 2 | 2 | 3 | 4 | 2 | 2 | 2 | 2 | 2 | 2 |
| HIMMELBF | 4 | 0 | 425 | 663 | —I— | 0 | 1171 | —I— | 822 | 582 | 425 | 636 | 370 | 187 | 270 | 585 | 368 | 590 | 537 | —S— | 167 | 48 | 107 |
| HIMMELBG | 2 | 0 | 3 | 3 | 0 | 0 | 4 | 1 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 8 | 7 | 3 | 5 | 0 | 6 | 4 | 3 |
| HIMMELBH | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBI | 100 | 12 | 1590 | 1779 | —I— | 0 | 1090 | —I— | 1212 | 1353 | 1584 | 1142 | 785 | —E— | 846 | 1574 | 6902 | 2383 | 5159 | —E— | 9056 | 2331 | 2370 |
| HIMMELBJ | 45 | 14 | —I— | —I— | 0 | 0 | —I— | 41405 | —I— | —I— | —I— | —I— | —S— | 451 | —I— | —I— | —I— | 422760 | —I— | —I— | —I— | —I— | —I— |
| HIMMELBK | 24 | 14 | 1116 | ( 116) | —I— | 0 | 1516 | —I— | 1325 | 1439 | ( 100) | 1007 | ( 89) | 475 | 297 | 1262 | 1390 | 1788 | 2035 | —I— | 1798 | 1284 | 1397 |
| HONG | 4 | 1 | 15 | 15 | 0 | 0 | 48 | 38 | 41 | 56 | 15 | 36 | 15 | 15 | 15 | 15 | 15 | 15 | 22 | 100 | 22 | 22 | 22 |
| HS1 | 2 | 0 | 28 | 37 | 0 | 0 | 49 | 113 | 55 | 28 | 28 | 53 | 28 | 26 | 27 | 28 | 27 | 34 | 32 | 32 | 24 | 24 | 24 |
| HS10 | 2 | 1 | 8 | 8 | 0 | 0 | 18 | —I— | 12 | 8 | 8 | 13 | 8 | 8 | 8 | 10 | 12 | 9 | 30 | 39 | 23 | 20 | 27 |
| HS100 | 7 | 4 | 229 | 301 | 0 | 0 | 176 | 1210 | 145 | 176 | 51 | 140 | 29 | 28 | 90 | 242 | 1163 | 265 | 340 | —I— | 302 | 219 | —I— |
| HS100MOD | 7 | 4 | 2198 | —S— | 0 | —I— | 1474 | —I— | —S— | —S— | —S— | 794 | 99 | 33 | 1969 | —S— | —I— | 3045 | 2452 | —I— | 2534 | —S— | —I— |
| HS101 | 7 | 5 | —I— | 911 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS102 | 7 | 5 | —I— | 1569 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS103 | 7 | 5 | —I— | —S— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS104 | 8 | 5 | 164 | 202 | 0 | 0 | 237 | 1042 | 205 | 378 | 52 | 191 | 52 | 34 | 47 | 164 | 163 | 165 | 479 | —I— | 304 | 219 | 496 |
| HS105 | 8 | 1 | ( 23) | 38 | ( 0) | 0 | 102 | ( 92) | ( 29) | ( 39) | ( 20) | 63 | ( 15) | ( 13) | 27 | ( 21) | ( 19) | ( 32) | —I— | —I— | 469 | ( 83) | —E— |
| HS106 | 8 | 6 | —I— | 69 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS107 | 9 | 6 | 97 | 96 | 0 | 0 | —S— | 1642 | 180 | 168 | 25 | 136 | 26 | 28 | 26 | 99 | 99 | 97 | —S— | —I— | 111 | 121 | 121 |
| HS108 | 9 | 13 | 92 | 92 | 0 | 0 | 181 | 131 | 112 | 97 | 127 | 67 | 20 | 40 | 29 | 93 | 105 | 169 | 319 | —I— | 142 | 148 | 148 |
| HS109 | 9 | 10 | —I— | 1289 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS11 | 2 | 1 | 5 | 5 | 0 | 0 | 13 | 51 | 10 | 5 | 5 | 8 | 5 | 5 | 5 | 5 | 6 | 5 | 6 | 37 | 6 | 6 | 6 |
| HS110 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 6 | 0 | 0 | 0 | 0 | 0 |
| HS111 | 10 | 3 | 130 | 130 | 0 | 0 | 217 | 505 | 187 | 166 | 62 | 185 | 35 | 51 | 98 | 142 | 128 | 166 | —I— | —I— | —I— | 318 | —I— |
| HS112 | 10 | 3 | 121 | 121 | 0 | 0 | 294 | 398 | 219 | 203 | 36 | 128 | 36 | 36 | 36 | 120 | 128 | 129 | 236 | —I— | 192 | 180 | 237 |
| HS113 | 10 | 8 | 521 | 289 | 0 | 0 | 539 | 2947 | 528 | 683 | 401 | 472 | 47 | 46 | 47 | 519 | 2976 | 659 | 546 | —I— | 489 | 510 | —I— |
| HS114 | 10 | 11 | 3957 | 810 | —I— | —I— | —I— | —I— | —S— | 6068 | 2849 | 2359 | —S— | 441 | —I— | 4249 | —S— | 3319 | —I— | —I— | —I— | 4576 | —I— |
| HS116 | 13 | 14 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS117 | 15 | 5 | 567 | 584 | —I— | —I— | 821 | 3888 | 473 | 321 | 381 | 560 | 184 | 218 | 234 | 490 | 708 | 967 | 3048 | —I— | 664 | 546 | —I— |
| HS118 | 15 | 17 | 170 | 170 | —I— | 0 | 350 | 1459 | 271 | 291 | 218 | 158 | 25 | 25 | 67 | 170 | 180 | 270 | 169 | 182 | 169 | 169 | 164 |
| HS119 | 16 | 8 | 212 | 245 | 0 | 0 | 199 | 408 | 247 | 240 | 61 | 153 | 53 | 53 | 53 | 213 | 206 | 221 | 803 | —I— | 283 | 280 | 450 |
| HS12 | 2 | 1 | 16 | 16 | 0 | 0 | 31 | 688 | 27 | 34 | 16 | 28 | 16 | 16 | 16 | 18 | 88 | 24 | 28 | —I— | 20 | 19 | 32 |
| HS13 | 2 | 1 | 5 | 9 | 0 | 0 | 6 | 12 | 5 | 9 | 5 | 5 | 5 | 5 | 5 | 8 | 8 | 6 | 5 | 7 | 5 | 5 | 5 |
| HS14 | 2 | 2 | 11 | 11 | 0 | 0 | 21 | 18 | 20 | 11 | 11 | 16 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 12 | 11 | 11 | 11 |
| HS15 | 2 | 2 | 38 | 38 | 0 | 0 | 74 | 379 | 72 | 40 | 38 | 69 | 37 | 36 | 37 | 39 | 39 | 45 | 71 | 96 | 45 | 52 | 80 |
| HS16 | 2 | 2 | 20 | 20 | 0 | 0 | 50 | 56 | 44 | 34 | 20 | 41 | 20 | 22 | 23 | 20 | 22 | 24 | 24 | 32 | 29 | 24 | 27 |
| HS17 | 2 | 2 | 21 | 21 | 0 | 0 | 40 | 55 | 43 | 27 | 21 | 46 | 22 | 19 | 18 | 21 | 22 | 27 | 26 | —S— | 26 | 32 | 34 |
| HS18 | 2 | 2 | 122 | 147 | 0 | 0 | 385 | 1840 | 267 | 303 | 122 | 201 | 72 | 72 | 72 | 124 | 126 | 140 | 165 | —I— | 137 | 129 | 153 |
| HS19 | 2 | 2 | 26 | —S— | 0 | 0 | 51 | —I— | 47 | 35 | 26 | 45 | 26 | 26 | 26 | 26 | 62 | 28 | 29 | 26 | 25 | 25 | 33 |
| HS2 | 2 | 0 | 1 | 6 | 0 | 0 | 3 | 40 | 3 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | 3 | 3 |
| HS20 | 2 | 3 | 20 | 20 | 0 | 0 | 48 | 74 | 50 | 39 | 20 | 34 | 20 | 20 | 20 | 21 | 22 | 21 | 21 | 26 | 22 | 21 | 21 |
| HS21 | 2 | 1 | 1 | 1 | 0 | 0 | 2 | 8 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 16 | 17 | 16 | 16 | 16 |
| HS22 | 2 | 2 | 6 | 6 | 0 | 0 | 13 | 22 | 12 | 6 | 6 | 10 | 6 | 6 | 6 | 6 | 7 | 6 | 9 | 9 | 9 | 9 | 9 |
| HS23 | 2 | 5 | 37 | 34 | 0 | 0 | 300 | 1452 | 166 | 234 | 37 | 224 | 43 | 41 | 31 | 37 | 139 | 123 | 36 | 38 | 36 | 36 | 36 |
| HS24 | 2 | 3 | 9 | 9 | 0 | 0 | 29 | 63 | 28 | 27 | 9 | 23 | 10 | 9 | 9 | 9 | 10 | 11 | 21 | 21 | 16 | 16 | 16 |

Number of cg-iterations ( 8 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS25 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS26 | 3 | 1 | 35 | 40 | 0 | 0 | 63 | 186 | 37 | 52 | 35 | 34 | 29 | 25 | 31 | 35 | 25 | 24 | 29 | —I— | 27 | 22 | 22 |
| HS27 | 3 | 1 | 16 | 24 | 0 | 0 | 50 | 49 | 26 | 29 | 16 | 38 | 16 | 15 | 16 | 16 | 12 | 22 | 26 | 95 | 30 | 17 | 24 |
| HS28 | 3 | 1 | 3 | 3 | 0 | 0 | 8 | 32 | 7 | 6 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 26 | 3 | 3 | 3 |
| HS29 | 3 | 1 | 24 | 24 | 0 | 0 | 33 | 305 | 40 | 69 | 24 | 38 | 23 | 26 | 25 | 24 | 61 | 40 | 34 | 46 | 30 | 36 | 41 |
| HS3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS30 | 3 | 1 | 6 | 6 | 0 | 0 | 12 | 12 | 11 | 11 | 6 | 11 | 6 | 6 | 6 | 7 | 6 | 7 | 7 | 15 | 7 | 7 | 7 |
| HS31 | 3 | 1 | 11 | 8 | 0 | 0 | 16 | 3 | 16 | 10 | 11 | 13 | 11 | 11 | 11 | 12 | 12 | 13 | 35 | —I— | 21 | 15 | 19 |
| HS32 | 3 | 2 | 14 | 15 | 0 | 0 | 24 | 66 | 31 | 17 | 14 | 23 | 14 | 14 | 14 | 14 | 9 | 9 | 17 | 19 | 17 | 17 | 17 |
| HS33 | 3 | 2 | ( 12) | ( 14) | ( 0) | ( 0) | ( 30) | ( 58) | ( 31) | ( 27) | ( 12) | ( 27) | ( 12) | ( 12) | ( 12) | ( 13) | ( 13) | ( 21) | ( 12) | ( 14) | ( 12) | ( 12) | 35 |
| HS34 | 3 | 2 | 20 | 20 | 0 | 0 | 56 | 98 | 53 | 37 | 20 | 15 | 24 | 20 | 24 | 21 | 19 | 33 | 26 | 26 | 22 | 22 | 22 |
| HS35 | 3 | 1 | 5 | 5 | 0 | 0 | 12 | 19 | 10 | 16 | 5 | 8 | 5 | 5 | 5 | 5 | 6 | 5 | 41 | —I— | 17 | 6 | 50 |
| HS36 | 3 | 1 | 13 | 13 | 0 | 0 | 19 | 153 | 22 | 21 | 13 | 22 | 13 | 13 | 13 | 16 | 22 | 16 | 16 | 16 | 15 | 15 | 15 |
| HS37 | 3 | 2 | 16 | 16 | 0 | 0 | 44 | 269 | 42 | 62 | 16 | 53 | 17 | 16 | 17 | 18 | 46 | 26 | 63 | 315 | 49 | 43 | 80 |
| HS38 | 4 | 0 | 55 | 55 | 0 | 0 | 177 | 232 | 193 | 109 | 55 | 138 | 65 | 56 | 55 | 55 | 50 | 68 | —I— | —I— | 54 | 54 | 21 |
| HS39 | 4 | 2 | 17 | 18 | 0 | 0 | 34 | 53 | 51 | 26 | 17 | 39 | 17 | 17 | 17 | 17 | 17 | 18 | 512 | 512 | 38 | 38 | 38 |
| HS4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS40 | 4 | 3 | 9 | 9 | 0 | 0 | 33 | 32 | 33 | 23 | 9 | 18 | 9 | 9 | 9 | 9 | 9 | 9 | 12 | 83 | 14 | 13 | 17 |
| HS41 | 4 | 1 | 7 | 7 | 0 | 0 | 9 | 8 | 10 | 15 | 7 | 7 | 5 | 7 | 6 | 7 | 2 | 7 | 10 | 11 | 11 | 10 | 10 |
| HS42 | 4 | 2 | 9 | 8 | 0 | 0 | 19 | 20 | 20 | 9 | 9 | 13 | 9 | 9 | 9 | 9 | 8 | 9 | 10 | 30 | 10 | 10 | 10 |
| HS43 | 4 | 3 | 34 | 34 | 0 | 0 | 80 | 146 | 82 | 99 | 22 | 82 | 25 | 24 | 26 | 34 | 125 | 39 | 501 | —I— | 44 | 44 | 44 |
| HS44 | 4 | 6 | 13 | 13 | ( 0) | ( 0) | 47 | ( 181) | ( 35) | ( 38) | 10 | ( 33) | ( 16) | ( 10) | ( 12) | 13 | 30 | 15 | 38 | —I— | 16 | 15 | 15 |
| HS45 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS46 | 5 | 2 | 24 | 24 | 0 | 0 | 53 | 89 | 57 | 88 | 24 | 29 | 17 | 19 | 31 | 28 | 28 | 31 | 26 | 44 | 17 | 24 | 22 |
| HS47 | 5 | 3 | ( 19) | 74 | 0 | 0 | ( 76) | ( 74) | ( 77) | ( 68) | ( 19) | ( 53) | ( 19) | ( 19) | ( 23) | ( 20) | ( 20) | ( 21) | ( 22) | ( 33) | ( 20) | ( 20) | ( 20) |
| HS48 | 5 | 2 | 3 | 3 | 0 | 0 | 17 | 40 | 24 | 8 | 3 | 8 | 3 | 3 | 3 | 3 | 3 | 5 | 2 | 30 | 2 | 2 | 2 |
| HS49 | 5 | 2 | 15 | 15 | 0 | 0 | 56 | 176 | 54 | 60 | 15 | 45 | 15 | 15 | 17 | 15 | 15 | 17 | 23 | 48 | 23 | 23 | 29 |
| HS5 | 2 | 0 | 2 | 2 | 0 | 0 | 4 | 5 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| HS50 | 5 | 3 | 12 | 13 | 0 | 0 | 46 | 641 | 40 | 40 | 12 | 36 | 12 | 12 | 12 | 11 | 9 | 17 | 17 | 39 | 17 | 17 | 17 |
| HS51 | 5 | 3 | 2 | 2 | 0 | 0 | 24 | 38 | 27 | 28 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 36 | 2 | 2 | 2 |
| HS52 | 5 | 3 | 5 | 6 | 0 | 0 | 32 | 86 | 44 | 32 | 5 | 25 | 5 | 5 | 5 | 5 | 7 | 5 | 9 | 39 | 9 | 9 | 9 |
| HS53 | 5 | 3 | 5 | 5 | 0 | 0 | 33 | 79 | 38 | 26 | 5 | 24 | 5 | 5 | 5 | 6 | 7 | 5 | 10 | 12 | 10 | 10 | 10 |
| HS54 | 6 | 1 | ( 0) | —S— | ( 0) | ( 0) | ( 0) | 214 | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 74) | ( 74) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) |
| HS55 | 6 | 6 | 4 | 4 | 0 | 0 | 27 | 25 | 27 | 18 | 4 | 18 | 4 | 4 | 7 | 4 | 4 | 4 | 6 | 6 | 6 | 6 | 6 |
| HS56 | 7 | 4 | 31 | 28 | 0 | 0 | 72 | 49 | 37 | 65 | 12 | 68 | 19 | 14 | 13 | 30 | 24 | 47 | —I— | —I— | 57 | 51 | 97 |
| HS57 | 2 | 1 | ( 1) | 10 | 0 | —I— | ( 2) | 23 | 31 | ( 4) | ( 1) | 14 | 17 | 11 | 11 | ( 1) | ( 1) | ( 1) | ( 11) | ( 32) | ( 9) | ( 9) | ( 9) |
| HS59 | 2 | 3 | 426 | 65 | ( 0) | ( 0) | 1460 | —I— | 1081 | 1125 | 426 | 1085 | 305 | 303 | 293 | 426 | —I— | ( 1289) | 680 | —I— | 455 | 448 | 624 |
| HS6 | 2 | 1 | 37 | 37 | 0 | 0 | 86 | 149 | 79 | 37 | 37 | 77 | 43 | 32 | 33 | 38 | 40 | 67 | 42 | 42 | 33 | 33 | 33 |
| HS60 | 3 | 1 | 14 | 18 | 0 | 0 | 36 | 37 | 45 | 35 | 14 | 36 | 12 | 23 | 21 | 15 | 14 | 16 | 17 | 33 | 19 | 19 | 19 |
| HS61 | 3 | 2 | 15 | 15 | 0 | 0 | 27 | 89 | 26 | 21 | 15 | 24 | 14 | 15 | 15 | 18 | 15 | 15 | 11 | 41 | 11 | 11 | 11 |
| HS62 | 3 | 1 | 29 | 29 | 0 | 0 | 70 | 325 | 68 | 60 | 29 | 66 | 29 | 29 | 29 | 30 | 27 | 32 | —I— | —I— | 50 | 50 | 50 |
| HS63 | 3 | 2 | 12 | 12 | 0 | 0 | 31 | 110 | 38 | 44 | 12 | 36 | 20 | 17 | 21 | 14 | 16 | 16 | 66 | 61 | 22 | 25 | 25 |
| HS64 | 3 | 1 | 36 | 40 | 0 | 0 | 72 | 41 | 56 | 60 | 36 | 43 | 36 | 36 | 36 | 42 | 41 | —T— | 48 | 51 | 48 | 48 | 48 |
| HS65 | 3 | 1 | 26 | 26 | 0 | 0 | 82 | 273 | 79 | 131 | 26 | 72 | 26 | 26 | 27 | 26 | 42 | 83 | 35 | 24 | 35 | 35 | 35 |
| HS66 | 3 | 2 | 15 | 20 | 0 | 0 | 32 | 23 | 22 | 13 | 15 | 12 | 9 | 12 | 11 | 15 | 12 | 17 | 18 | 31 | 18 | 16 | 18 |
| HS67 | 3 | 14 | 171 | 86 | —I— | 0 | 734 | 275 | 126 | 123 | 99 | 114 | 65 | 47 | 81 | 171 | 164 | 281 | —I— | —I— | 533 | 181 | —S— |
| HS68 | 4 | 2 | 74 | —I— | 0 | 0 | 251 | 1413 | 209 | 172 | 74 | 89 | 68 | 73 | 72 | 80 | 74 | 87 | —I— | —I— | 149 | 136 | —I— |
| HS69 | 4 | 2 | 26 | 105 | 0 | 0 | 78 | —S— | 78 | —S— | 26 | 63 | 28 | 26 | 26 | 30 | —S— | 29 | —I— | —I— | 90 | —S— | —I— |
| HS7 | 2 | 1 | 8 | 8 | 0 | 0 | 24 | 25 | 14 | 8 | 8 | 14 | 8 | 8 | 8 | 8 | 10 | 8 | 17 | 31 | 21 | 21 | 21 |
| HS70 | 4 | 1 | 28 | 26 | ( 0) | 0 | 85 | ( 1890) | 50 | 68 | 28 | 28 | 20 | 37 | 30 | 27 | 22 | 55 | —I— | —I— | 66 | 50 | 44 |
| HS71 | 4 | 2 | 23 | 23 | 0 | 0 | 60 | 115 | 64 | 63 | 23 | 51 | 23 | 23 | 23 | 23 | 22 | 24 | 83 | —I— | 34 | 32 | 44 |
| HS72 | 4 | 2 | 67 | 67 | 0 | 0 | 253 | 89 | 132 | 127 | 67 | 85 | 63 | 64 | 64 | 85 | 93 | —T— | 87 | 88 | 87 | 87 | 87 |
| HS73 | 4 | 3 | 23 | 25 | —I— | 0 | 57 | 1617 | 64 | 42 | 23 | 66 | 31 | 30 | 27 | 22 | 121 | 25 | 22 | 22 | 22 | 24 | 24 |
| HS74 | 4 | 5 | 68 | 56 | 0 | 0 | 91 | —I— | 69 | 104 | 68 | 65 | 19 | 19 | 51 | 68 | 64 | 90 | —S— | 169 | 70 | 70 | 176 |
| HS75 | 4 | 5 | —S— | 71 | —S— | —I— | —I— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS76 | 4 | 3 | 9 | 9 | 0 | 0 | 40 | 50 | 33 | 34 | 9 | 23 | 9 | 9 | 9 | 9 | 9 | 11 | 37 | —I— | 15 | 22 | 34 |
| HS77 | 5 | 2 | 19 | 15 | 0 | 0 | 56 | ( 206) | 58 | 52 | 19 | 65 | 16 | 18 | 20 | 19 | 19 | 34 | 30 | —I— | 16 | 14 | 14 |
| HS78 | 5 | 3 | 9 | 9 | 0 | 0 | 23 | 34 | 31 | 23 | 9 | 20 | 9 | 7 | 12 | 13 | 12 | 8 | 24 | 39 | 14 | 12 | 50 |
| HS79 | 5 | 3 | 18 | 14 | 0 | 0 | 42 | 55 | 45 | 50 | 18 | 40 | 10 | 13 | 15 | 18 | 14 | 26 | 12 | 34 | 12 | 18 | 18 |

Number of cg-iterations ( 9 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS8 | 2 | 2 | 4 | 4 | 0 | 0 | 11 | 11 | 10 | 4 | 4 | 7 | 4 | 5 | 6 | 7 | 9 | 7 | 6 | 6 | 6 | 5 | 7 |
| HS80 | 5 | 3 | 15 | 15 | 0 | 0 | 37 | 47 | 28 | 43 | 15 | 45 | 12 | 11 | 20 | 16 | 17 | 21 | 17 | 26 | 10 | 18 | 33 |
| HS81 | 5 | 3 | 16 | ( 923) | 0 | 0 | 36 | 49 | 27 | 37 | 16 | 38 | 12 | 11 | 19 | 16 | 17 | 22 | 851 | 62 | 29 | 27 | 51 |
| HS83 | 5 | 3 | 29 | 23 | 0 | 0 | 76 | 398 | 60 | 65 | 29 | 57 | 26 | 41 | 34 | 31 | 30 | 32 | 39 | 40 | 33 | 31 | 51 |
| HS84 | 5 | 3 | —S— | —S— | —I— | —I— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS85 | 5 | 21 | —I— | 777 | —I— | —I— | —I— | —I— | —S— | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —S— | —S— | —I— |
| HS86 | 5 | 10 | —S— | 132 | —I— | 0 | 174 | 562 | 134 | 151 | 53 | 120 | 49 | 45 | 52 | —S— | 141 | 128 | 956 | —I— | 288 | 151 | 779 |
| HS87 | 6 | 4 | 192 | —S— | —I— | —S— | —S— | —I— | —S— | —S— | 276 | —S— | —S— | —S— | 92 | 249 | 105 | 167 | —I— | —I— | 149 | 261 | —S— |
| HS88 | 2 | 1 | 47 | 47 | 0 | 0 | 77 | 78 | 81 | 47 | 47 | 67 | 48 | 46 | 46 | 49 | 48 | 52 | 55 | 81 | 71 | 62 | 48 |
| HS89 | 3 | 1 | ( 48) | ( 48) | ( 0) | ( 0) | ( 85) | ( 92) | ( 78) | ( 51) | ( 48) | ( 78) | 41 | ( 53) | ( 49) | ( 51) | ( 79) | —T— | ( 47) | ( 127) | ( 72) | ( 68) | ( 66) |
| HS9 | 2 | 1 | 4 | 4 | 0 | 0 | 8 | 76 | 8 | 4 | 4 | 7 | 4 | 4 | 4 | 4 | 5 | 5 | 9 | 9 | 9 | 9 | 9 |
| HS90 | 4 | 1 | —E— | —E— | —E— | —E— | —E— | 121 | —E— | —E— | —E— | 97 | —E— | —E— | —E— | 64 | 72 | 70 | —E— | 104 | —E— | —E— | —E— |
| HS91 | 5 | 1 | —E— | —E— | 0 | —E— | 103 | —E— | —E— | ( 104) | —E— | —E— | —E— | —E— | —E— | ( 87) | ( 63) | 81 | —E— | —I— | —E— | —E— | —E— |
| HS92 | 6 | 1 | —E— | —E— | —E— | —E— | —E— | 90 | —E— | —E— | —E— | —E— | 44 | 53 | —E— | 74 | 72 | 92 | —E— | —I— | —E— | —E— | —E— |
| HS93 | 6 | 2 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HS95 | 6 | 4 | 39 | 194 | —I— | 0 | 36 | 641 | 64 | 110 | 41 | 35 | 46 | 23 | 52 | 39 | 50 | 340 | 83 | 77 | 32 | 108 | 63 |
| HS96 | 6 | 4 | 37 | 177 | —I— | 0 | 213 | 869 | 67 | 109 | 112 | 33 | 46 | 32 | 18 | 39 | 57 | 123 | 83 | 77 | 35 | 33 | 61 |
| HS97 | 6 | 4 | 156 | ( 167) | ( 0) | ( 0) | ( 59) | ( 830) | ( 42) | ( 136) | 161 | ( 88) | ( 23) | ( 64) | ( 160) | 165 | ( 211) | ( 38) | ( 209) | —I— | ( 149) | ( 114) | ( 291) |
| HS98 | 6 | 4 | 135 | 388 | —I— | ( 0) | ( 46) | ( 844) | ( 42) | ( 178) | 160 | ( 54) | ( 23) | ( 34) | ( 140) | 176 | ( 213) | ( 40) | ( 97) | ( 164) | ( 119) | ( 111) | ( 197) |
| HS99 | 7 | 2 | —I— | —S— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —I— | —I— | —E— | —F— | —I— |
| HS99EXP | 31 | 21 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —I— | —F— | —I— | —I— | —E— | —I— | —I— | —I— | —I— | —I— | —I— |
| HUBFIT | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 3 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HYDCAR20 | 99 | 99 | —F— | —E— | —F— | 0 | 8404 | —E— | —F— | —F— | —F— | 130 | 469 | 197 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDCAR6 | 29 | 29 | —F— | —E— | —F— | 0 | —F— | 2607 | —F— | —F— | —F— | 90 | 112 | 88 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDROELL | 1009 | 1008 | 16663 | 53128 | —I— | —I— | 51854 | —I— | 37492 | 16663 | 16663 | 2362 | 6801 | 3830 | 36006 | 22624 | —I— | 18632 | —I— | —I— | 32851 | 31591 | —I— |
| HYDROELM | 505 | 504 | 24867 | 27608 | —I— | —I— | 28894 | —I— | 16813 | 24867 | 24867 | 1975 | 1886 | 1881 | 15999 | 18108 | —I— | 22399 | —I— | —I— | 19299 | —I— | —I— |
| HYDROELS | 169 | 168 | 3186 | 6709 | —I— | —I— | 3731 | —I— | 2318 | 3186 | 3186 | 680 | 1046 | 496 | 2654 | 3339 | —I— | 3431 | —I— | —I— | 8452 | —I— | —I— |
| HYPCIR | 2 | 0 | 6 | 7 | 0 | 0 | 12 | 9 | 9 | 6 | 6 | 7 | 6 | 6 | 6 | 7 | 5 | 8 | 4 | 4 | 3 | 6 | 4 |
| INTEGREQ | 12 | 0 | 3 | 5 | 0 | 0 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| INTEGREQ | 52 | 0 | 3 | 9 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| INTEGREQ | 102 | 0 | 3 | —S— | 0 | 0 | 5 | 3 | 3 | 3 | 4 | 2 | 2 | 2 | 2 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 |
| JENSMP | 2 | 0 | 5 | 5 | 0 | 0 | 14 | 41 | 10 | 5 | 5 | 9 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | —I— | 5 | 5 | 5 |
| JNLBRNG1 | 16 | 0 | 2 | 2 | 0 | 0 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| JNLBRNG1 | 100 | 0 | 21 | 23 | 0 | 0 | 24 | 37 | 22 | 21 | 1 | 1 | 1 | 1 | 3 | 21 | 31 | 21 | 24 | 63 | 24 | 24 | 25 |
| JNLBRNG1 | 529 | 0 | 70 | —S— | 0 | 0 | 93 | 157 | 72 | 70 | 70 | 4 | 4 | 4 | 7 | 68 | 72 | 68 | 213 | 501 | 213 | 213 | 222 |
| JNLBRNG1 | 1024 | 0 | 115 | 119 | 0 | 0 | 158 | 256 | 120 | 115 | 115 | 5 | 5 | 5 | 12 | 115 | 91 | 115 | 402 | 993 | 402 | 402 | 413 |
| JNLBRNG1 | 5625 | 0 | 687 | 463 | 0 | 0 | 928 | 1508 | 723 | 687 | 687 | 14 | 14 | 14 | 60 | 687 | 520 | 568 | 2442 | —I— | 2442 | 2442 | 2439 |
| JNLBRNG1 | 10000 | 0 | 1201 | 747 | 0 | 0 | 1719 | 2612 | 1242 | 1201 | 1201 | 19 | 19 | 19 | 114 | 1212 | 1018 | 968 | 4227 | —T— | 4227 | 4227 | 4234 |
| JNLBRNG1 | 15625 | 0 | 2002 | —I— | 0 | 0 | 2497 | 4056 | 1979 | 2002 | 2002 | 24 | 24 | 24 | 868 | 1972 | 1773 | 1613 | 1891 | —T— | 1891 | 1891 | 1868 |
| JNLBRNG2 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| JNLBRNG2 | 100 | 0 | 15 | 20 | 0 | 0 | 28 | 27 | 16 | 15 | 2 | 2 | 2 | 2 | 4 | 15 | 16 | 15 | 18 | 85 | 18 | 18 | 19 |
| JNLBRNG2 | 529 | 0 | 44 | —S— | 0 | 0 | 108 | 109 | 47 | 44 | 44 | 2 | 2 | 2 | 7 | 44 | 42 | 43 | 80 | 781 | 79 | 80 | 82 |
| JNLBRNG2 | 1024 | 0 | 68 | 84 | 0 | 0 | 187 | 146 | 71 | 68 | 68 | 3 | 3 | 3 | 10 | 66 | 59 | 66 | 101 | 1077 | 101 | 101 | 103 |
| JNLBRNG2 | 5625 | 0 | 320 | 267 | 0 | 0 | 966 | 954 | 342 | 320 | 320 | 9 | 9 | 9 | 30 | 315 | 241 | 310 | 567 | —I— | 567 | 567 | 624 |
| JNLBRNG2 | 10000 | 0 | 570 | 441 | 0 | 0 | 1697 | 1471 | 583 | 570 | 570 | 11 | 11 | 11 | 46 | 570 | 430 | 532 | 832 | —I— | 832 | 832 | 833 |
| JNLBRNG2 | 15625 | 0 | 958 | —I— | 0 | 0 | 2867 | 2295 | 1042 | 958 | 958 | 14 | 14 | 14 | 737 | 948 | 838 | 792 | 1989 | —T— | 1989 | 1989 | 2013 |
| KOWOSB | 4 | 0 | 10 | 15 | 0 | 0 | 45 | 42 | 26 | 30 | 10 | 22 | 13 | 8 | 11 | 10 | 8 | 33 | 21 | —S— | 11 | 27 | 27 |
| LCH | 30 | 1 | 139 | —F— | —I— | 0 | ( 153) | ( 185) | ( 101) | 139 | 84 | 111 | 23 | 24 | 97 | 139 | 131 | 156 | —I— | —I— | 383 | 200 | 276 |
| LCH | 150 | 1 | 133 | —F— | ( 0) | 0 | ( 452) | 1495 | 386 | 333 | 84 | 108 | 65 | 23 | 96 | 135 | 149 | 123 | —I— | —I— | 361 | 212 | 195 |
| LCH | 300 | 1 | 140 | —F— | 0 | 0 | ( 840) | 2844 | 618 | 550 | 94 | 101 | 80 | 22 | 109 | 129 | 134 | 139 | —I— | —I— | 376 | 239 | 216 |
| LCH | 600 | 1 | 144 | —F— | —T— | —T— | ( 1298) | 5047 | 889 | 933 | 108 | 106 | 83 | 28 | 112 | 135 | 141 | 160 | —I— | —I— | 374 | 228 | 227 |
| LEAKNET | 156 | 153 | —S— | —F— | —I— | —I— | —I— | —I— | —S— | —I— | —S— | 288 | 162 | 163 | —I— | —S— | ( 68596) | —S— | —I— | —I— | —S— | —S— | —I— |
| LEWISPOL | 6 | 9 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| LIARWHD | 36 | 0 | 23 | 46 | 0 | 0 | 16 | 93 | 14 | 23 | 26 | 23 | 8 | 8 | 8 | 24 | 38 | 21 | 23 | 25 | 23 | 23 | 23 |
| LIARWHD | 100 | 0 | 22 | 55 | 0 | 0 | 13 | 58 | 13 | 24 | 21 | 25 | 6 | 6 | 6 | 27 | 38 | 22 | 22 | 24 | 22 | 22 | 22 |
| LIARWHD | 500 | 0 | 25 | 55 | 0 | 0 | 14 | 44 | 16 | 29 | 26 | 25 | 7 | 7 | 7 | 39 | 26 | 24 | 25 | 24 | 25 | 25 | 25 |
| LIARWHD | 1000 | 0 | 31 | 73 | 0 | 0 | 14 | 42 | 16 | 31 | 29 | 27 | 11 | 11 | 11 | 43 | 42 | 25 | 31 | 21 | 31 | 31 | 31 |
| LIARWHD | 5000 | 0 | 41 | 65 | 0 | 0 | 16 | 80 | 16 | ( 31) | 26 | 24 | 11 | 11 | 11 | 48 | 64 | 26 | 41 | ( 30) | 41 | 41 | 41 |
| LIARWHD | 10000 | 0 | ( 30) | 58 | 0 | 0 | 16 | 191 | 16 | ( 48) | 41 | 26 | 11 | 11 | 11 | 49 | 46 | 25 | ( 30) | ( 62) | ( 30) | ( 30) | ( 30) |

Number of cg-iterations ( 10 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINVERSE | 19 | 0 | 30 | 155 | ( 0) | 0 | 44 | 115 | 32 | ( 21) | 30 | 31 | 26 | 46 | 30 | 20 | 19 | 95 | —I— | —I— | 65 | 16 | —I— |
| LINVERSE | 199 | 0 | 114 | 605 | —I— | 0 | 180 | 1197 | 115 | 158 | 114 | 204 | 228 | 293 | 400 | 274 | 104 | 501 | —I— | —I— | 187 | 166 | —I— |
| LINVERSE | 999 | 0 | 948 | ( 3862) | 0 | 0 | 2033 | 16610 | 435 | 780 | 948 | 1426 | 580 | 713 | 613 | 1353 | 512 | 2680 | —I— | —S— | 1152 | 734 | 1888 |
| LINVERSE | 1999 | 0 | 2027 | —S— | 0 | —T— | ( 1626) | 23668 | 837 | 1885 | 2027 | 1821 | 1405 | 1209 | 1546 | 1504 | 2787 | 5494 | —I— | —S— | 1725 | 1440 | —I— |
| LMINSURF | 16 | 0 | 5 | 5 | 0 | 0 | 11 | 8 | 15 | 13 | 5 | 5 | 5 | 5 | 5 | 7 | 6 | 5 | 4 | 10 | 4 | 4 | 4 |
| LMINSURF | 49 | 0 | 35 | 31 | 0 | 0 | 64 | 53 | 47 | 46 | 12 | 12 | 12 | 12 | 15 | 36 | 50 | 81 | 33 | 115 | 33 | 32 | 38 |
| LMINSURF | 64 | 0 | 72 | 68 | 0 | 0 | 65 | 52 | 76 | 70 | 12 | 12 | 12 | 12 | 18 | 65 | 84 | 132 | 82 | 260 | 82 | 82 | —I— |
| LMINSURF | 121 | 0 | 108 | 145 | 0 | 0 | 138 | 138 | 107 | 139 | 11 | 11 | 11 | 11 | 26 | 126 | 108 | 252 | 108 | 579 | 108 | 108 | 117 |
| LMINSURF | 961 | 0 | 469 | 467 | 0 | 0 | 1257 | 610 | 463 | 469 | 469 | 21 | 21 | 21 | 116 | 472 | 506 | 1774 | 546 | —I— | 555 | 518 | 467 |
| LMINSURF | 1024 | 0 | 551 | 599 | 0 | 0 | 1148 | 586 | 583 | 560 | 504 | 21 | 21 | 21 | 123 | 631 | 554 | 2055 | 497 | —I— | 541 | 525 | —I— |
| LMINSURF | 5625 | 0 | —I— | —I— | 0 | —T— | —I— | 2159 | —I— | —I— | —I— | 38 | 38 | 38 | 771 | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| LMINSURF | 10000 | 0 | —I— | —I— | 0 | —T— | —I— | —I— | —I— | —I— | —I— | 39 | 39 | 39 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —I— |
| LMINSURF | 15625 | 0 | —T— | —T— | 0 | —T— | —I— | —I— | —T— | —T— | —T— | 44 | 44 | 44 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| LSQFIT | 2 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| LUBRIF | 151 | 100 | —F— | —I— | —I— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —I— | —F— | —F— | —F— | —I— | —I— | —I— | —F— | —I— |
| LUBRIF | 751 | 500 | —T— | —T— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| MANCINO | 10 | 0 | 0 | —S— | 0 | 0 | 3 | 106 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MANCINO | 20 | 0 | 1 | —S— | 0 | 0 | 3 | —I— | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| MANCINO | 30 | 0 | 2 | —S— | 0 | 0 | 3 | —I— | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 4 | 0 | 2 | 2 | 2 | 2 | 2 |
| MANCINO | 50 | 0 | 4 | —S— | 0 | 0 | 8 | —I— | 5 | 5 | 4 | 4 | 3 | 3 | 3 | 6 | 10 | 7 | 4 | 4 | 4 | 4 | 4 |
| MANNE | 300 | 200 | 69 | 254 | —I— | 0 | 495 | 371 | 514 | 290 | 69 | 137 | 120 | 1418 | 84 | 74 | 54 | 70 | 308 | 308 | 102 | 102 | 102 |
| MANNE | 1095 | 730 | —S— | 7891 | —S— | 0 | 9674 | 1271 | —S— | 781 | —S— | —T— | 210 | —E— | 367 | 223 | 242 | 336 | 522 | 522 | 250 | 250 | —S— |
| MARATOS | 2 | 1 | 3 | 7 | 0 | 0 | 6 | 6 | 5 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 26 | 4 | 4 | 4 |
| MARATOSB | 2 | 0 | —I— | —I— | —I— | —I— | —I— | 0 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| MATRIX2 | 6 | 2 | 9 | 9 | 0 | 0 | 26 | 38 | 22 | 14 | 9 | 14 | 9 | 9 | 9 | 9 | 10 | 11 | 12 | 37 | 12 | 12 | 12 |
| MAXLIKA | 8 | 0 | ( 17) | 65 | 0 | 0 | 122 | 138 | ( 19) | 61 | 36 | 79 | 33 | ( 12) | 42 | ( 16) | ( 17) | ( 21) | —I— | —S— | 338 | 161 | 1014 |
| MCCORMCK | 10 | 0 | 4 | 5 | 0 | 0 | 8 | 8 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 29 | 5 | 5 | 5 |
| MCCORMCK | 50 | 0 | 4 | 8 | 0 | 0 | 9 | 9 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 5 | 27 | 5 | 5 | 5 |
| MCCORMCK | 100 | 0 | 4 | 8 | 0 | 0 | 9 | 8 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 5 | 28 | 5 | 5 | 5 |
| MCCORMCK | 500 | 0 | 4 | 9 | 0 | 0 | 9 | 7 | 7 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 5 | 36 | 5 | 5 | 5 |
| MCCORMCK | 1000 | 0 | 4 | 9 | 0 | 0 | 9 | 7 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 7 | 4 | 5 | 33 | 5 | 5 | 5 |
| MCCORMCK | 5000 | 0 | 4 | 4 | 0 | 0 | 9 | 7 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 37 | 5 | 5 | 5 |
| MCCORMCK | 10000 | 0 | 4 | 4 | 0 | 0 | 9 | 6 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 5 | 4 | 5 | 32 | 5 | 5 | 5 |
| MDHOLE | 2 | 0 | 62 | 62 | 0 | 0 | 108 | 287 | 96 | 62 | 62 | 87 | 58 | 46 | 55 | 65 | 42 | 62 | 60 | 54 | 53 | 53 | 53 |
| METHANB8 | 31 | 31 | —I— | —E— | 0 | 0 | 58 | 1674 | —F— | —F— | 351 | 12 | 8 | 8 | —F— | —I— | —I— | —S— | —S— | —F— | —I— | —S— | —S— |
| METHANL8 | 31 | 31 | —F— | —E— | 0 | 0 | 1250 | —E— | —F— | —F— | —F— | 360 | 460 | 81 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| MEXHAT | 2 | 0 | 6 | 6 | 0 | 0 | 34 | —I— | 8 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 4 | 4 | 11 | 350 | 8 | 10 | 8 |
| MEYER3 | 3 | 0 | 796 | —S— | —I— | —I— | 889 | —I— | —S— | 801 | 796 | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | 1021 | —S— | —I— |
| MINPERM | 5 | 5 | 5 | 5 | 0 | 0 | 10 | 10 | 10 | 29 | 5 | 20 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| MINPERM | 13 | 10 | 55 | 55 | 0 | 0 | 21 | 20 | 21 | 68 | 25 | 30 | 25 | 22 | 36 | 55 | 55 | 44 | 105 | —I— | 116 | 67 | 67 |
| MINPERM | 27 | 19 | 94 | 94 | 0 | 0 | 32 | 34 | 29 | 88 | 107 | 58 | 83 | 71 | 211 | 94 | 89 | 88 | 329 | —I— | 141 | 99 | 99 |
| MINPERM | 51 | 36 | 123 | 123 | 0 | 0 | 44 | 32 | 32 | 140 | 123 | 222 | 42 | 196 | 155 | 123 | 123 | 117 | 574 | —I— | 287 | 122 | 109 |
| MINPERM | 93 | 69 | 63 | 63 | 0 | 0 | 51 | 47 | 44 | 210 | 221 | 1059 | 116 | 364 | 655 | 63 | 63 | 64 | 1594 | —I— | 74 | 107 | 106 |
| MINPERM | 169 | 134 | 1054 | 1054 | —I— | 0 | 81 | 65 | 64 | 369 | 242 | 1325 | 999 | 1278 | 1497 | 1009 | 318 | 1916 | 8224 | —T— | 467 | 398 | 383 |
| MINPERM | 311 | 263 | 649 | 649 | —I— | 0 | 92 | 77 | 67 | 187 | 248 | 1444 | 527 | 1981 | 3098 | 692 | 541 | 3556 | 8335 | —T— | 859 | 790 | 812 |
| MINPERM | 583 | 520 | 11987 | 11987 | —T— | —T— | 105 | 90 | 73 | 134 | 163 | —T— | —T— | —I— | 6709 | 16066 | 877 | 3112 | —I— | —T— | 1426 | 2378 | 1209 |
| MINPERM | 1113 | 1033 | 1680 | 1680 | —T— | —T— | 135 | 109 | 98 | 179 | 89 | —T— | —T— | —T— | 183 | 3249 | 3350 | 3751 | 12205 | —I— | 11228 | 4175 | 4801 |
| MINSURF | 64 | 0 | 25 | 22 | 0 | 0 | 21 | 20 | 23 | 19 | 8 | 8 | 8 | 8 | 9 | 25 | 21 | 26 | 21 | 53 | 21 | 21 | 19 |
| MISTAKE | 9 | 13 | 183 | 183 | 0 | 0 | 220 | 206 | 234 | 178 | 188 | 182 | 49 | 49 | 30 | 180 | 175 | 297 | 462 | —I— | 346 | 178 | 177 |
| MSQRTA | 4 | 0 | 20 | 20 | 0 | 0 | 35 | 44 | 35 | 36 | 20 | 22 | 20 | 20 | 20 | 22 | 22 | 22 | 14 | 15 | 12 | 12 | 12 |
| MSQRTA | 49 | 0 | 84 | —I— | 0 | 0 | 154 | 140 | 129 | 101 | 125 | 81 | 15 | 18 | 19 | 113 | 142 | 123 | 121 | —I— | 100 | 156 | 94 |
| MSQRTA | 100 | 0 | 230 | 278 | 0 | 0 | 471 | 320 | 241 | 307 | 212 | 219 | 36 | 29 | 44 | 240 | 239 | 358 | 301 | —I— | 223 | 226 | 305 |
| MSQRTA | 529 | 0 | 5392 | 5392 | —T— | —T— | 5127 | 4301 | 5686 | 5976 | 5224 | —T— | —T— | —T— | —T— | —T— | 6215 | 8396 | 8667 | —I— | 5943 | 5423 | 5764 |
| MSQRTA | 1024 | 0 | 6036 | 6036 | —T— | —T— | —T— | 6176 | 6006 | 3938 | 5815 | —T— | —T— | —T— | —T— | —T— | 4679 | —T— | —T— | —T— | 4991 | 4679 | —T— |
| MSQRTB | 9 | 0 | 27 | 30 | 0 | 0 | 34 | 35 | 41 | 28 | 13 | 29 | 11 | 10 | 13 | 27 | 20 | 30 | 26 | —I— | 20 | 24 | 24 |
| MSQRTB | 49 | 0 | 147 | 292 | 0 | 0 | 241 | 236 | 191 | 175 | 169 | 99 | 22 | 22 | 27 | ( 45258) | 174 | 226 | 176 | —I— | 130 | 139 | 121 |
| MSQRTB | 100 | 0 | 292 | 358 | 0 | 0 | 403 | 455 | 312 | 320 | 264 | 187 | 50 | 31 | 60 | 317 | 246 | 529 | 359 | —I— | 282 | 301 | 300 |
| MSQRTB | 529 | 0 | 4451 | 4451 | —T— | —T— | 7611 | 4306 | 4614 | 5406 | 4447 | 1926 | —T— | —T— | —T— | 5874 | 4842 | 11328 | 5743 | —I— | 4076 | 3582 | 4550 |
| MSQRTB | 1024 | 0 | 3325 | 3325 | —T— | —T— | 3906 | 3447 | 3763 | 3651 | 4074 | —T— | —T— | —T— | —T— | 4403 | 2886 | 4598 | —T— | —T— | 2439 | 3263 | —T— |

Number of cg-iterations ( 11 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MWRIGHT | 5 | 3 | ( 19) | 22 | ( 0) | ( 0) | ( 78) | ( 93) | ( 78) | ( 58) | ( 19) | ( 62) | ( 19) | ( 19) | ( 21) | ( 19) | ( 18) | ( 21) | ( 550) | ( 626) | ( 28) | ( 28) | ( 31) |
| NGONE | 8 | 8 | 37 | 67 | 0 | 0 | 85 | 74 | 71 | 60 | 26 | 42 | 17 | 26 | 23 | 37 | 39 | 50 | 224 | —I— | 79 | 81 | 81 |
| NGONE | 12 | 19 | 257 | 502 | 0 | 0 | —E— | 231 | 255 | 323 | 184 | 158 | 59 | 68 | 63 | 282 | 260 | 377 | 757 | —I— | 423 | 282 | 247 |
| NGONE | 50 | 323 | —I— | —I— | —I— | —I— | ( 43101) | —I— | —I— | ( 4018) | —I— | —I— | ( 705) | 1015 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | ( 23443) | —I— |
| NGONE | 100 | 1273 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —T— | 5222 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| NGONE | 500 | 31373 | —T— | —T— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —M— | —M— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NLMSURF | 16 | 0 | 7 | 7 | 0 | 0 | 19 | 13 | 21 | 20 | 7 | 7 | 7 | 7 | 7 | 11 | 10 | 9 | 7 | 55 | 7 | 7 | 6 |
| NLMSURF | 49 | 0 | 126 | 130 | 0 | 0 | 159 | 181 | 113 | 116 | 22 | 22 | 22 | 22 | 38 | 88 | 127 | 159 | 113 | 641 | 132 | 132 | 151 |
| NLMSURF | 64 | 0 | 122 | 156 | 0 | 0 | 215 | 218 | 155 | 146 | 13 | 13 | 13 | 13 | 52 | 122 | 157 | 213 | 140 | —I— | 139 | 139 | 161 |
| NLMSURF | 121 | 0 | 260 | 277 | 0 | 0 | 527 | 436 | 330 | 280 | 16 | 16 | 16 | 16 | 127 | 292 | 335 | 465 | 299 | —I— | 356 | 356 | 490 |
| NLMSURF | 961 | 0 | 1471 | 1685 | 0 | 0 | —I— | 2454 | 1944 | 1657 | 1477 | 18 | 18 | 18 | 320 | 1780 | 1593 | 1799 | 1565 | —I— | 1758 | 1590 | 1977 |
| NLMSURF | 1024 | 0 | 1761 | 1736 | 0 | 0 | —I— | 2656 | 2113 | 1606 | 1719 | 19 | 19 | 19 | 388 | 1814 | 1643 | 1771 | 1520 | —I— | 1620 | 1564 | 1665 |
| NLMSURF | 5625 | 0 | —I— | —I— | 0 | 0 | —I— | —I— | —I— | —I— | —I— | 23 | 23 | 23 | —I— | —I— | —I— | 5148 | —I— | —I— | —I— | —I— | —I— |
| NLMSURF | 10000 | 0 | —I— | —I— | 0 | —T— | —I— | —I— | —I— | —I— | —I— | 22 | 22 | 22 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —E— |
| NLMSURF | 15625 | 0 | —T— | —T— | 0 | —T— | —I— | —I— | —T— | —T— | —T— | 27 | 27 | 27 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONDIA | 10 | 0 | 34 | 32 | 0 | 0 | 34 | 12 | 33 | 34 | 9 | 37 | 17 | 23 | 14 | 37 | 34 | 37 | 44 | 44 | 18 | 18 | 18 |
| NONDIA | 20 | 0 | 41 | 39 | 0 | 0 | 33 | 21 | 23 | 47 | 40 | 46 | 20 | 16 | 22 | 32 | 43 | 68 | 42 | 42 | 21 | 21 | 21 |
| NONDIA | 30 | 0 | 81 | 55 | 0 | 0 | 44 | 77 | 148 | 58 | 99 | 57 | 29 | 25 | 25 | 106 | 79 | 145 | 42 | 42 | 48 | 48 | 48 |
| NONDIA | 50 | 0 | 82 | 70 | 0 | 0 | 37 | 101 | 229 | 66 | 162 | 160 | 21 | 31 | 26 | 77 | 90 | 125 | 61 | 61 | 94 | 94 | 79 |
| NONDIA | 90 | 0 | 128 | 84 | 0 | 0 | 32 | 133 | 88 | 161 | 162 | 71 | 29 | 29 | 43 | 190 | 102 | 148 | 123 | 123 | 170 | 170 | 170 |
| NONDIA | 100 | 0 | 149 | 79 | 0 | 0 | 41 | 140 | 130 | 62 | 90 | 219 | 29 | 29 | 37 | 121 | 86 | 161 | 118 | 118 | 163 | 163 | 150 |
| NONDIA | 500 | 0 | 284 | 70 | 0 | 0 | 51 | 284 | 170 | 230 | 276 | 176 | 24 | 24 | 39 | 119 | 80 | 122 | 53 | 53 | 311 | 311 | 287 |
| NONDIA | 1000 | 0 | 249 | 80 | 0 | 0 | 51 | 389 | 231 | 211 | 294 | 237 | 25 | 25 | 36 | 87 | 78 | 153 | 73 | 73 | 77 | 77 | 72 |
| NONDIA | 5000 | 0 | 127 | ( 103) | 0 | —T— | 46 | —I— | 134 | 198 | 91 | 181 | 22 | 22 | 37 | 171 | 109 | —T— | 114 | 114 | 192 | 192 | 129 |
| NONDIA | 10000 | 0 | 165 | 135 | 0 | —T— | 45 | —I— | 279 | 99 | 77 | 237 | 25 | 25 | 38 | 135 | 86 | —T— | 126 | 126 | 113 | 113 | 89 |
| NONDQUAR | 100 | 0 | 22 | 22 | 0 | 0 | 676 | 1753 | 461 | 21 | 23 | 17 | 12 | 12 | 12 | 22 | 24 | 21 | 22 | 22 | 22 | 22 | 22 |
| NONDQUAR | 500 | 0 | 20 | 20 | 0 | 0 | 813 | 4188 | 491 | 20 | 21 | 17 | 11 | 11 | 11 | 20 | 24 | 20 | 20 | 20 | 20 | 20 | 20 |
| NONDQUAR | 1000 | 0 | 19 | 19 | 0 | 0 | 853 | 6717 | 675 | 19 | 20 | 17 | 12 | 12 | 12 | 19 | 21 | 19 | 19 | 19 | 19 | 19 | 19 |
| NONDQUAR | 5000 | 0 | 19 | 19 | 0 | 0 | 776 | 23256 | 580 | 19 | 19 | 25 | 11 | 11 | 11 | 19 | 23 | 18 | 19 | 19 | 19 | 19 | 19 |
| NONMSQRT | 9 | 0 | 380 | 650 | —I— | —I— | ( 525) | —I— | ( 479) | ( 1250) | 380 | ( 300) | ( 3227) | 313 | 421 | 341 | ( 477) | ( 509) | —I— | —S— | 226 | 165 | —I— |
| NONMSQRT | 49 | 0 | —I— | —I— | —I— | —I— | ( 6149) | —I— | ( 27878) | —I— | ( 97803) | 1284 | —I— | 1354 | ( 55766) | —I— | —I— | —T— | —I— | —S— | —I— | —I— | —I— |
| NONMSQRT | 100 | 0 | —T— | —T— | —I— | —I— | 19933 | —I— | ( 90412) | —T— | —I— | —S— | —T— | —S— | —I— | —T— | —T— | —T— | —I— | —S— | —T— | —T— | —I— |
| NONMSQRT | 529 | 0 | —T— | —T— | —I— | —I— | —T— | —I— | —T— | —T— | —T— | —S— | —T— | —S— | —T— | —T— | —T— | —T— | —E— | —I— | —T— | —T— | —T— |
| NONMSQRT | 1024 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONSCOMP | 25 | 0 | 8 | 9 | 0 | 0 | 34 | 87 | 28 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 7 | 7 | 7 | 7 | 7 |
| NONSCOMP | 50 | 0 | 8 | 9 | 0 | 0 | 45 | 79 | 34 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 5 | 5 | 7 | 7 | 7 |
| NONSCOMP | 100 | 0 | 8 | 9 | 0 | 0 | 46 | 71 | 33 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 10 | 4 | 4 | 7 | 7 | 7 |
| NONSCOMP | 500 | 0 | 8 | 9 | 0 | 0 | 40 | 62 | 32 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 10 | 4 | 4 | 7 | 7 | 7 |
| NONSCOMP | 1000 | 0 | 8 | 9 | 0 | 0 | 40 | 66 | 36 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 9 | 10 | 4 | 4 | 7 | 7 | 7 |
| NONSCOMP | 5000 | 0 | 8 | 9 | 0 | 0 | 41 | 63 | 33 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 10 | 10 | 5 | 5 | 7 | 7 | 7 |
| NONSCOMP | 10000 | 0 | 8 | 9 | 0 | 0 | 42 | 58 | 27 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 11 | 10 | 5 | 5 | 7 | 7 | 7 |
| NYSTROM5 | 18 | 20 | —F— | —F— | —F— | 0 | 99 | 679 | 131 | 205 | —F— | 56 | 51 | —F— | 60 | —F— | —F— | 464 | 568 | —F— | 574 | —F— | —F— |
| OBSTCLAE | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLAE | 100 | 0 | 34 | 42 | 0 | 0 | 39 | 54 | 39 | 35 | 27 | 27 | 27 | 28 | 34 | 34 | 34 | 60 | 91 | 60 | 60 | 60 | 60 |
| OBSTCLAE | 529 | 0 | 177 | 218 | 0 | 0 | 203 | 191 | 184 | 177 | 177 | 180 | 180 | 180 | 178 | 177 | 203 | 177 | 207 | 533 | 207 | 207 | 207 |
| OBSTCLAE | 1024 | 0 | 359 | 438 | 0 | 0 | 396 | 352 | 338 | 359 | 360 | 386 | 386 | 386 | 380 | 353 | 379 | 361 | 405 | 965 | 405 | 405 | 406 |
| OBSTCLAE | 5625 | 0 | 2517 | 2549 | 0 | —T— | 2610 | 3244 | 2553 | 2517 | 2517 | 2429 | 2429 | 2429 | 2412 | 2517 | 2531 | 2474 | 2630 | —I— | 2630 | 2630 | 2625 |
| OBSTCLAE | 10000 | 0 | 4654 | 4645 | —T— | —T— | 4775 | 5813 | 4757 | 4654 | —T— | —T— | —T— | —T— | —T— | 4654 | 4667 | 4604 | 4841 | —T— | 4841 | 4841 | 4835 |
| OBSTCLAE | 15625 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| OBSTCLAL | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLAL | 100 | 0 | 9 | 15 | 0 | 0 | 15 | 15 | 14 | 10 | 3 | 3 | 3 | 3 | 3 | 9 | 9 | 9 | 13 | 41 | 13 | 13 | 16 |
| OBSTCLAL | 529 | 0 | 33 | 48 | 0 | 0 | 52 | 51 | 44 | 35 | 30 | 6 | 6 | 6 | 6 | 33 | 32 | 31 | 36 | 125 | 36 | 36 | 107 |
| OBSTCLAL | 1024 | 0 | 55 | 71 | 0 | 0 | 90 | 82 | 73 | 55 | 54 | 7 | 7 | 7 | 11 | 55 | 48 | 47 | 59 | 217 | 59 | 59 | 56 |
| OBSTCLAL | 5625 | 0 | 243 | 198 | 0 | 0 | 394 | 343 | 327 | 243 | 240 | 16 | 16 | 16 | 38 | 243 | 194 | 189 | 259 | —I— | 259 | 259 | 259 |
| OBSTCLAL | 10000 | 0 | 413 | 373 | 0 | 0 | 652 | 547 | 567 | 413 | 409 | 19 | 19 | 19 | 59 | 413 | 336 | 307 | 381 | —I— | 381 | 381 | 402 |
| OBSTCLAL | 15625 | 0 | 604 | 509 | 0 | 0 | 991 | 798 | 824 | 604 | 604 | 24 | 24 | 24 | 79 | 604 | 481 | 447 | 527 | —T— | 527 | 527 | 484 |
| OBSTCLBL | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBL | 100 | 0 | 6 | 2 | 0 | 0 | 8 | 11 | 9 | 11 | 6 | 6 | 6 | 6 | 6 | 7 | 2 | 6 | 8 | 42 | 8 | 8 | 8 |
| OBSTCLBL | 529 | 0 | 84 | 190 | 0 | 0 | 97 | 87 | 89 | 84 | 81 | 69 | 69 | 69 | 69 | 92 | 45 | 86 | 78 | 219 | 78 | 78 | 78 |

Number of cg-iterations ( 12 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBSTCLBL | 1024 | 0 | 178 | 364 | 0 | 0 | 201 | 203 | 202 | 177 | 181 | 151 | 151 | 151 | 151 | 183 | 116 | 172 | 139 | 468 | 139 | 139 | 139 |
| OBSTCLBL | 5625 | 0 | 720 | —S— | 0 | 0 | 842 | 886 | 818 | 723 | 723 | 613 | 613 | 613 | 618 | 749 | 1200 | 697 | 546 | —I— | 546 | 546 | 789 |
| OBSTCLBL | 10000 | 0 | 1349 | —S— | 0 | 0 | 1699 | 1573 | 1622 | 1349 | 1352 | 1115 | 1115 | 1115 | 3851 | 1372 | 2244 | 1294 | 1019 | —T— | 1019 | 1089 | 1434 |
| OBSTCLBL | 15625 | 0 | 2083 | —S— | —T— | 0 | 2657 | 2331 | 2522 | 2083 | 2101 | 1651 | 1651 | 1651 | —T— | 2105 | 3414 | 1977 | 2095 | —T— | 2094 | 2154 | 2158 |
| OBSTCLBM | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBM | 100 | 0 | 3 | 24 | 0 | 0 | 5 | 5 | 6 | 6 | 3 | 3 | 3 | 3 | 4 | 6 | 3 | 3 | 2 | 25 | 2 | 2 | 2 |
| OBSTCLBM | 529 | 0 | 49 | 114 | 0 | 0 | 57 | 59 | 56 | 49 | 48 | 30 | 30 | 30 | 31 | 30 | 47 | 47 | 36 | 132 | 36 | 36 | 36 |
| OBSTCLBM | 1024 | 0 | 109 | 349 | 0 | 0 | 126 | 114 | 120 | 109 | 109 | 88 | 88 | 88 | 88 | 49 | 108 | 108 | 90 | 371 | 90 | 90 | 90 |
| OBSTCLBM | 5625 | 0 | 488 | 1731 | 0 | 0 | 531 | 510 | 528 | 488 | 488 | 415 | 415 | 415 | 417 | 182 | 459 | 486 | 338 | —I— | 338 | 338 | 339 |
| OBSTCLBM | 10000 | 0 | 795 | 2914 | 0 | 0 | 861 | 863 | 872 | 795 | 791 | 675 | 675 | 675 | —T— | 296 | 972 | 785 | 705 | —T— | 705 | 705 | 718 |
| OBSTCLBM | 15625 | 0 | 1378 | —T— | 0 | 0 | 1497 | 1496 | 1484 | 1378 | 1396 | 1188 | 1188 | 1188 | —T— | 506 | 2632 | 1384 | 870 | —T— | 870 | 870 | 870 |
| OBSTCLBU | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBU | 100 | 0 | 1 | 1 | 0 | 0 | 6 | 5 | 5 | 6 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 6 | 38 | 6 | 6 | 6 |
| OBSTCLBU | 529 | 0 | 37 | 57 | 0 | 0 | 57 | 52 | 47 | 37 | 36 | 11 | 11 | 11 | 14 | 37 | 36 | 31 | 74 | 271 | 74 | 74 | 74 |
| OBSTCLBU | 1024 | 0 | 53 | 121 | 0 | 0 | 78 | 66 | 70 | 53 | 52 | 15 | 15 | 15 | 17 | 56 | 51 | 49 | 122 | 383 | 122 | 122 | 151 |
| OBSTCLBU | 5625 | 0 | 247 | 766 | 0 | 0 | 353 | 295 | 330 | 248 | 247 | 72 | 72 | 72 | 85 | 239 | 348 | 227 | 304 | —I— | 304 | 304 | 326 |
| OBSTCLBU | 10000 | 0 | 415 | 1230 | 0 | 0 | 639 | 566 | 575 | 439 | 416 | 88 | 88 | 88 | 114 | 411 | 773 | 349 | 528 | —T— | 528 | 528 | 583 |
| OBSTCLBU | 15625 | 0 | 621 | 1938 | 0 | 0 | 1000 | 789 | 834 | 628 | 612 | 129 | 129 | 129 | 792 | 686 | 1350 | 512 | 827 | —T— | 824 | 827 | 965 |
| OPTCNTRL | 32 | 20 | 59 | 78 | 0 | 0 | 390 | 2913 | 423 | 403 | 70 | 57 | 45 | 45 | 45 | 59 | 60 | 76 | 62 | 75 | 62 | 62 | 62 |
| OPTMASS | 70 | 55 | —I— | 4970 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| OPTMASS | 610 | 505 | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 1210 | 1005 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 3010 | 2505 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —E— | —I— | —I— | —I— | —I— |
| ORTHREGA | 133 | 64 | 689 | —S— | 0 | —I— | —S— | —I— | 848 | 831 | 837 | 2793 | 75 | 113 | 527 | 668 | 675 | 2201 | —I— | —I— | 1194 | 754 | —I— |
| ORTHREGA | 517 | 256 | 731 | 1995 | —T— | —I— | 1688 | —I— | 1119 | 1123 | 799 | 5128 | 106 | —T— | 1016 | 720 | 736 | 5963 | —I— | —I— | 1120 | 838 | —I— |
| ORTHREGA | 2053 | 1024 | 804 | —S— | —M— | —I— | 2493 | —I— | 1158 | 1154 | —S— | —T— | 194 | —E— | —T— | 854 | 837 | 15781 | —I— | —I— | 1190 | 972 | —I— |
| ORTHREGA | 8197 | 4096 | —S— | —S— | —M— | —T— | 2557 | —I— | 1259 | —S— | 925 | —E— | —T— | —E— | —T— | 906 | 955 | —T— | —I— | —I— | —S— | —S— | —T— |
| ORTHREGB | 27 | 6 | 475 | 1319 | —I— | 0 | 44 | —I— | 2918 | 489 | 399 | 956 | 105 | 172 | 530 | 554 | 759 | 4847 | 360 | —I— | 481 | 361 | 1023 |
| ORTHREGC | 25 | 10 | 137 | 282 | ( 0) | 0 | 191 | ( 1821) | 291 | 171 | 140 | 154 | 28 | —I— | 41 | 149 | 136 | ( 425) | —I— | —I— | ( 206) | ( 212) | ( 202) |
| ORTHREGC | 105 | 50 | ( 277) | 3800 | 0 | ( 0) | 496 | —I— | 391 | ( 221) | ( 293) | 261 | 46 | 47 | ( 1059) | ( 241) | 136 | ( 751) | —I— | —I— | 282 | 214 | 1027 |
| ORTHREGC | 505 | 250 | ( 236) | 756 | 0 | ( 0) | 456 | —I— | 358 | ( 327) | ( 275) | 340 | 45 | 59 | 149 | 148 | 139 | ( 2844) | —I— | —I— | 220 | 201 | 692 |
| ORTHREGC | 1005 | 500 | 186 | —S— | 0 | ( 0) | 489 | —I— | 427 | 259 | 200 | 485 | 55 | 94 | 141 | 187 | 179 | ( 6392) | —I— | —I— | ( 397) | ( 331) | ( 1506) |
| ORTHREGC | 5005 | 2500 | 363 | —T— | —T— | —T— | 1134 | —I— | 807 | 405 | 311 | 1982 | 381 | —M— | 354 | 367 | 364 | —T— | —I— | —I— | 455 | 394 | —I— |
| ORTHREGC | 10005 | 5000 | 428 | —T— | —M— | —T— | 1070 | —I— | 815 | 408 | —S— | —T— | 115 | —M— | —T— | 483 | 425 | —T— | —T— | —T— | 600 | 502 | —T— |
| ORTHREGD | 23 | 10 | 1385 | —F— | 0 | 0 | 112 | —I— | 1690 | 1321 | 1512 | 438 | 65 | 70 | 348 | 1723 | 1021 | 908 | 1031 | 1390 | 1132 | 1008 | 903 |
| ORTHREGD | 103 | 50 | 2010 | —F— | 0 | 0 | 180 | —I— | 3406 | 2103 | 2071 | 469 | 78 | —S— | 221 | —S— | —S— | 3385 | 1122 | —I— | 1026 | 1086 | 1133 |
| ORTHREGD | 503 | 250 | 1156 | —F— | —I— | —I— | 147 | —I— | —I— | 1076 | 976 | 250 | 65 | 219 | 215 | —S— | —S— | 7814 | 680 | —S— | 542 | —S— | —I— |
| ORTHREGD | 1003 | 500 | 796 | —F— | —I— | —I— | 181 | —I— | —I— | 1070 | 940 | 325 | 94 | —S— | 229 | —S— | —S— | 13062 | 527 | —S— | 520 | 561 | —I— |
| ORTHREGD | 5003 | 2500 | 559 | —F— | —T— | —T— | 211 | —I— | 6190 | 568 | —S— | 545 | 131 | —T— | 120 | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —I— |
| ORTHREGD | 10003 | 5000 | 445 | —F— | —M— | —T— | 195 | —T— | —S— | 350 | 410 | —T— | —T— | —E— | —T— | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —T— |
| ORTHREGE | 36 | 20 | —S— | ( 1716) | ( 0) | —I— | 381 | —I— | —S— | —S— | ( 3489) | ( 397) | —I— | —I— | —I— | —S— | ( 1406) | —S— | —I— | —I— | —I— | —S— | —I— |
| ORTHREGF | 80 | 25 | 119 | 755 | 0 | 0 | 191 | 505 | 226 | 257 | 133 | 67 | 45 | 39 | 48 | 106 | 115 | 432 | 210 | —I— | 156 | 185 | 153 |
| ORTHREGF | 152 | 49 | 136 | —I— | 0 | 0 | 146 | 379 | 304 | 316 | 143 | 79 | 44 | 49 | 42 | 145 | 142 | 900 | 406 | —I— | 176 | 268 | 195 |
| ORTHREGF | 305 | 100 | ( 134) | —I— | ( 0) | 0 | 238 | ( 904) | ( 380) | ( 583) | ( 142) | ( 117) | 39 | 61 | ( 71) | ( 177) | ( 134) | ( 1789) | —I— | —I— | ( 116) | ( 162) | ( 153) |
| ORTHREGF | 680 | 225 | ( 211) | ( 928) | 0 | ( 0) | 303 | ( 1324) | ( 413) | ( 636) | ( 138) | ( 142) | 49 | 74 | ( 131) | ( 182) | ( 245) | 3027 | —I— | —I— | ( 181) | ( 173) | ( 331) |
| ORTHREGF | 1205 | 400 | —S— | —S— | ( 0) | ( 0) | 449 | ( 3796) | ( 466) | ( 812) | ( 525) | ( 137) | 53 | 80 | 87 | ( 281) | ( 244) | ( 4158) | —I— | —I— | ( 181) | ( 215) | ( 234) |
| OSBORNEA | 5 | 0 | 49 | —E— | 0 | 0 | 212 | —I— | 210 | 213 | 49 | 75 | 24 | 35 | 92 | 49 | 88 | 104 | 260 | —S— | 130 | 115 | 114 |
| OSBORNEB | 11 | 0 | 59 | 73 | 0 | 0 | 194 | —E— | 70 | 66 | 30 | 77 | 18 | 18 | 11 | 71 | ( 206) | 90 | 190 | —I— | 50 | 109 | 86 |
| PALMER1 | 4 | 0 | 14 | —S— | 0 | 0 | 35 | 105 | 24 | 21 | 14 | 27 | 14 | 14 | 45 | 29 | 32 | 29 | 30 | —S— | 45 | 17 | —S— |
| PALMER1A | 6 | 0 | 64 | 60 | 0 | —S— | 660 | —I— | —S— | 317 | 64 | 263 | 59 | 79 | 60 | 67 | 65 | 105 | 276 | —I— | 63 | 106 | 116 |
| PALMER1B | 4 | 0 | 28 | 33 | 0 | 0 | 68 | —I— | 54 | 64 | 28 | 53 | 22 | 22 | 22 | 43 | 31 | 38 | 81 | —S— | 33 | 45 | 45 |
| PALMER1C | 8 | 0 | 90 | 110 | 0 | 0 | 1354 | —I— | 231 | —S— | 388 | 46 | 7 | 7 | 102 | 109 | 179 | 408 | 90 | 90 | 90 | 90 | 90 |
| PALMER1D | 7 | 0 | 42 | 37 | 0 | 0 | 683 | —I— | 41 | 52 | 42 | 33 | 7 | 7 | 82 | 43 | 40 | 65 | 42 | 42 | 42 | 42 | 42 |
| PALMER1E | 8 | 0 | 2525 | 1397 | —I— | 0 | 3577 | —I— | 1784 | 1104 | 1698 | 639 | 708 | 744 | 1055 | 1732 | 1087 | 1681 | —I— | —I— | 2646 | 1206 | 1399 |
| PALMER2 | 4 | 0 | 9 | 31 | 0 | 0 | 28 | 62 | 43 | 18 | 9 | 54 | 9 | 9 | 10 | 16 | 23 | 38 | 105 | —S— | 29 | 16 | 24 |
| PALMER2A | 6 | 0 | 246 | 268 | 0 | 0 | 430 | 1259 | 361 | 685 | 246 | 332 | 116 | 93 | 113 | 240 | 266 | 305 | 660 | —I— | 249 | 272 | 358 |
| PALMER2B | 4 | 0 | 66 | 66 | 0 | 0 | 50 | —I— | 77 | 94 | 66 | 73 | 66 | 66 | 66 | 18 | 16 | 30 | 64 | —S— | 68 | 77 | —S— |
| PALMER2C | 8 | 0 | 85 | —S— | 0 | 0 | 666 | —I— | 301 | 147 | 90 | 64 | 6 | 6 | 99 | 372 | 115 | 228 | 85 | 85 | 85 | 85 | 85 |
| PALMER2E | 8 | 0 | 1267 | 1335 | 0 | 0 | 1676 | —I— | 1578 | 1755 | 1199 | 661 | 334 | 284 | 1587 | 1509 | 1466 | 2937 | —I— | —I— | 815 | 1959 | 2008 |

Number of cg-iterations ( 13 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PALMER3 | 4 | 0 | 24 | 32 | 0 | 0 | ( 27) | 163 | ( 25) | 33 | 24 | ( 25) | 18 | 18 | 24 | 63 | 15 | 41 | ( 39) | —I— | ( 33) | ( 38) | 98 |
| PALMER3A | 6 | 0 | 239 | 274 | 0 | 0 | 654 | —I— | 390 | 564 | 239 | 296 | 133 | 98 | 112 | 258 | 274 | 353 | —I— | —S— | 283 | 283 | 297 |
| PALMER3B | 4 | 0 | 46 | 46 | 0 | 0 | 49 | 74 | 52 | 84 | 46 | 50 | 27 | 41 | 17 | 16 | 32 | 27 | 33 | —S— | 16 | 9 | 9 |
| PALMER3C | 8 | 0 | 84 | 124 | 0 | 0 | 100 | —I— | 170 | 210 | 81 | 33 | 6 | 6 | 100 | 91 | 83 | 322 | 84 | 84 | 84 | 84 | 84 |
| PALMER3E | 8 | 0 | 554 | ( 312) | 0 | 0 | 1175 | —I— | 1221 | 1124 | 917 | 278 | 45 | 40 | 1103 | 796 | 703 | 1643 | —I— | —I— | 569 | 1005 | 1054 |
| PALMER4 | 4 | 0 | 23 | 37 | ( 0) | 0 | ( 28) | 54 | ( 23) | 28 | 23 | ( 24) | 24 | 28 | 23 | 48 | 16 | 41 | —I— | —S— | ( 51) | 36 | —S— |
| PALMER4A | 6 | 0 | 46 | 68 | 0 | 0 | 327 | —I— | 162 | 278 | 46 | 208 | 84 | 52 | 77 | 68 | 64 | 85 | 125 | —I— | 70 | 101 | 92 |
| PALMER4B | 4 | 0 | 19 | 19 | 0 | 0 | 71 | 67 | 48 | 75 | 19 | 44 | 46 | 18 | 21 | —S— | 31 | 29 | 14 | —I— | 22 | 16 | 16 |
| PALMER4C | 8 | 0 | 368 | 297 | 0 | 0 | 814 | —I— | 241 | 140 | 310 | 103 | 6 | 6 | 166 | 152 | 260 | 361 | 368 | 368 | 368 | 368 | 368 |
| PALMER4E | 8 | 0 | 284 | 476 | 0 | 0 | 910 | —I— | 642 | 454 | 478 | 350 | 65 | 20 | 780 | 352 | 714 | 826 | —I— | —I— | 540 | 789 | 929 |
| PENALTY1 | 4 | 0 | 28 | 48 | 0 | 0 | 36 | 71 | 53 | 67 | 28 | 28 | 28 | 28 | 28 | 19 | 23 | 55 | 29 | 40 | 29 | 29 | 29 |
| PENALTY1 | 10 | 0 | 129 | 183 | 0 | 0 | 50 | 92 | 108 | 159 | 27 | 27 | 27 | 27 | 27 | 122 | 128 | 271 | 125 | 82 | 125 | 125 | 125 |
| PENALTY1 | 50 | 0 | 473 | 594 | 0 | 0 | 59 | —I— | 172 | 652 | 298 | 29 | 30 | 29 | 29 | 359 | 286 | 1045 | 431 | 397 | 431 | 431 | 544 |
| PENALTY1 | 100 | 0 | 610 | 545 | 0 | 0 | 51 | —I— | 190 | 877 | 503 | 26 | 25 | 25 | 25 | 530 | 431 | 1355 | 587 | 512 | 587 | 587 | 594 |
| PENALTY1 | 500 | 0 | 527 | 440 | 0 | 0 | 52 | —I— | 104 | 1104 | 553 | 28 | 25 | 25 | 25 | 489 | 382 | 3482 | 591 | 543 | 591 | 591 | 568 |
| PENALTY1 | 1000 | 0 | 432 | 356 | —T— | —T— | 44 | —I— | 72 | 447 | 424 | —T— | —T— | —T— | —T— | 453 | 414 | 5834 | 432 | 512 | 432 | 432 | 539 |
| PENALTY2 | 4 | 0 | 5 | 72 | 0 | 0 | 7 | 16 | 6 | 6 | 5 | 49 | 47 | 47 | 13 | 5 | 8 | 8 | 4 | 3 | 4 | 4 | 4 |
| PENALTY2 | 10 | 0 | 260 | 785 | 0 | 0 | 34 | 737 | 158 | 61 | 109 | 129 | 64 | 64 | 108 | 289 | 292 | 255 | 260 | 77 | 260 | 260 | 260 |
| PENALTY2 | 50 | 0 | 149 | 131 | 0 | 0 | 117 | 110 | 74 | 273 | 173 | 298 | 30 | 27 | 48 | 180 | 115 | 391 | 149 | 198 | 149 | 149 | 137 |
| PENALTY2 | 100 | 0 | 68 | 95 | 0 | 0 | 150 | 100 | 49 | 74 | 67 | 74 | 19 | 19 | 19 | 68 | 71 | 61 | 78 | 225 | 74 | 78 | 75 |
| PENALTY3 | 50 | 0 | 43 | —S— | —S— | —S— | 60 | —I— | —S— | 35 | —S— | 206 | 69 | 61 | —S— | ( 790) | —S— | 104 | —I— | —S— | —S— | 103 | —S— |
| PENALTY3 | 100 | 0 | —S— | —S— | —S— | —S— | 111 | —I— | 55 | —S— | 37 | 386 | —S— | 60 | —S— | —I— | 35 | —S— | —I— | —T— | —S— | 120 | —S— |
| PENTAGON | 6 | 15 | 55 | 834 | 0 | 0 | 66 | 165 | 68 | 61 | 81 | 39 | 19 | 17 | 24 | 55 | 55 | 55 | 221 | —I— | 289 | 234 | 234 |
| POWELLBS | 2 | 0 | 50 | 50 | 0 | 0 | 58 | 925 | 54 | 50 | 50 | 29 | 26 | 24 | 53 | 52 | 52 | 58 | 52 | 52 | 52 | 52 | —S— |
| POWELLSG | 4 | 0 | 15 | 15 | 0 | 0 | 57 | 77 | 50 | 37 | 15 | 32 | 15 | 15 | 13 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 8 | 0 | 15 | 15 | 0 | 0 | 57 | 76 | 50 | 37 | 15 | 21 | 15 | 15 | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 16 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 50 | 37 | 15 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 20 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 50 | 37 | 15 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 36 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 51 | 40 | 15 | 15 | 15 | 15 | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 40 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 51 | 40 | 15 | 15 | 15 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 60 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 51 | 40 | 15 | 15 | 15 | 15 | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 80 | 0 | 15 | 15 | 0 | 0 | 58 | 76 | 51 | 40 | 15 | 15 | 15 | 15 | 14 | 15 | 14 | 15 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 100 | 0 | 15 | 15 | 0 | 0 | 59 | 76 | 53 | 40 | 15 | 15 | 15 | 15 | 14 | 15 | 15 | 16 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 500 | 0 | 15 | 15 | 0 | 0 | 59 | 76 | 54 | 40 | 15 | 15 | 15 | 15 | 16 | 15 | 14 | 16 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 1000 | 0 | 15 | 15 | 0 | 0 | 60 | 76 | 57 | 41 | 15 | 15 | 15 | 15 | 16 | 15 | 18 | 18 | 15 | 15 | 15 | 15 | 15 |
| POWELLSG | 5000 | 0 | 17 | 18 | 0 | 0 | 60 | 76 | 58 | 44 | 17 | 15 | 15 | 15 | 17 | 17 | 15 | 18 | 17 | 17 | 17 | 17 | 17 |
| POWELLSG | 10000 | 0 | 17 | 18 | 0 | 0 | 62 | 76 | 58 | 44 | 17 | 15 | 15 | 15 | 17 | 17 | 14 | 18 | 17 | 17 | 17 | 17 | 17 |
| POWELLSQ | 2 | 0 | 2 | 1 | 0 | 0 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 16 | 2 | 0 | 0 | 0 | 0 | 0 |
| POWER | 10 | 0 | 24 | 39 | 0 | 0 | 51 | 32 | 33 | 35 | 15 | 16 | 15 | 15 | 15 | 24 | 24 | 21 | 25 | 12 | 25 | 25 | 25 |
| POWER | 20 | 0 | 28 | 42 | 0 | 0 | 78 | 36 | 36 | 36 | 27 | 20 | 18 | 18 | 18 | 28 | 28 | 22 | 30 | 24 | 30 | 30 | 30 |
| POWER | 30 | 0 | 32 | 44 | 0 | 0 | 98 | 39 | 37 | 38 | 28 | 21 | 19 | 19 | 19 | 32 | 34 | 25 | 37 | 29 | 37 | 37 | 37 |
| POWER | 50 | 0 | 35 | 61 | 0 | 0 | 121 | 41 | 39 | 41 | 33 | 22 | 20 | 20 | 20 | 35 | 40 | 29 | 44 | 35 | 44 | 44 | 44 |
| POWER | 75 | 0 | 38 | 62 | 0 | 0 | 135 | 42 | 41 | 42 | 35 | 23 | 21 | 21 | 21 | 38 | 44 | 33 | 45 | 39 | 45 | 45 | 45 |
| POWER | 100 | 0 | 44 | 65 | 0 | 0 | 185 | 40 | 42 | 44 | 40 | 25 | 22 | 22 | 22 | 44 | 47 | 38 | 46 | 39 | 46 | 46 | 46 |
| POWER | 500 | 0 | 52 | 74 | 0 | 0 | 427 | —I— | 50 | 50 | 53 | 29 | 26 | 26 | 26 | 52 | 53 | 50 | 50 | 43 | 50 | 50 | 50 |
| POWER | 1000 | 0 | 53 | 78 | —T— | —T— | 613 | —I— | 52 | 52 | 54 | —T— | —T— | —T— | —T— | 53 | 55 | 52 | 52 | 44 | 52 | 52 | 52 |
| PROBPENL | 10 | 0 | 237 | 236 | ( 0) | —I— | ( 100) | ( 0) | ( 0) | ( 0) | ( 48) | ( 2) | ( 0) | ( 2) | ( 83) | 239 | ( 1) | ( 168) | ( 4) | ( 4) | ( 1) | ( 1) | ( 1) |
| PROBPENL | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 5 | 5 | 3 | 3 | 3 |
| PROBPENL | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 3 | 2 | 2 | 2 |
| PROBPENL | 500 | 0 | 0 | —S— | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 2 | 2 | 2 | 2 | 2 |
| PRODPL0 | 60 | 29 | —S— | —S— | —I— | 0 | 801 | 862 | 638 | 724 | —S— | 404 | 277 | 420 | 213 | 598 | —S— | —S— | 698 | 21833 | —S— | 700 | 1324 |
| PRODPL1 | 60 | 29 | 1127 | 1127 | —I— | —I— | 1528 | 2453 | 1023 | 1221 | 624 | 615 | 699 | 298 | 481 | 1242 | 1331 | 2245 | 1206 | —I— | 1283 | 1271 | 2546 |
| PSPDOC | 4 | 0 | 6 | 6 | 0 | 0 | 16 | 13 | 13 | 6 | 6 | 11 | 6 | 6 | 6 | 7 | 8 | 3 | 2 | 2 | 2 | 2 | 6 |
| QUARTC | 25 | 0 | 18 | 22 | 0 | 0 | 34 | 0 | 18 | 18 | 18 | 18 | 18 | 18 | 18 | 20 | 21 | 18 | 18 | 18 | 18 | 18 | 18 |
| QUARTC | 100 | 0 | 21 | 41 | 0 | 0 | 90 | —I— | 21 | 21 | 21 | 21 | 21 | 21 | 21 | 23 | 25 | 21 | 21 | 21 | 21 | 21 | 21 |
| QUARTC | 500 | 0 | 26 | 125 | 0 | 0 | 162 | —I— | 26 | 26 | 26 | 26 | 26 | 26 | 26 | 27 | 31 | 26 | 26 | 26 | 26 | 26 | 26 |
| QUARTC | 1000 | 0 | 27 | 278 | 0 | 0 | 223 | —I— | 27 | 27 | 27 | 27 | 27 | 27 | 27 | 28 | 33 | 27 | 27 | 27 | 27 | 27 | 27 |
| QUARTC | 5000 | 0 | 31 | 1559 | 0 | 0 | 368 | —I— | 31 | 31 | 31 | 31 | 31 | 31 | 31 | 33 | 42 | 31 | 31 | 31 | 31 | 31 | 31 |
| QUARTC | 10000 | 0 | 33 | 3078 | ( 0) | ( 0) | 466 | —I— | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 35 | 46 | 33 | 33 | 33 | 33 | 33 | 33 |

Number of cg-iterations ( 14 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| READING1 | 202 | 100 | 18888 | —F— | —I— | —I— | 107273 | 167365 | —I— | —I— | 16288 | 7152 | —I— | 7791 | —I— | 17539 | 11689 | 29115 | —I— | —I— | 16507 | —I— | —I— |
| READING2 | 303 | 200 | 1800 | 147570 | —I— | —I— | —T— | 210598 | 14002 | 13975 | 1800 | 721 | 2935 | 721 | 2809 | 2052 | 2224 | 2102 | 1800 | 1800 | 1800 | 1800 | 1800 |
| READING3 | 202 | 101 | —I— | —S— | —I— | —I— | 436165 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 74671 | —I— | —I— | —I— | —I— | —I— |
| RECIPE | 3 | 0 | 1 | 11 | 0 | 0 | 2 | 14 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 9 | 10 | 1 | 23 | —I— | 14 | 9 | 9 |
| ROSENBR | 2 | 0 | 8 | 8 | 0 | 0 | 15 | 31 | 20 | 8 | 8 | 19 | 8 | 8 | 8 | 8 | 9 | 9 | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) |
| S277-280 | 4 | 4 | 26 | 26 | 0 | 0 | 20 | 232 | 15 | 22 | 26 | 15 | 15 | 15 | 42 | 24 | 21 | 34 | 26 | 26 | 26 | 26 | 26 |
| S277-280 | 6 | 6 | 109 | 109 | —I— | 0 | 44 | 361 | 49 | 51 | 17 | 19 | 27 | 29 | 38 | 40 | 56 | 71 | 108 | 109 | 109 | 108 | 109 |
| S277-280 | 8 | 8 | 27 | 27 | —I— | 0 | 46 | 202 | 49 | 28 | 19 | 59 | 36 | 60 | 80 | 75 | 97 | 27 | 27 | 27 | 27 | 27 | 27 |
| S277-280 | 10 | 10 | 99 | 130 | —I— | 0 | 21 | 173 | 20 | 41 | 43 | 65 | 55 | 1450 | 44 | 123 | 113 | 94 | 99 | 99 | 99 | 99 | 99 |
| S308 | 2 | 0 | 6 | 6 | 0 | 0 | 10 | 12 | 11 | 6 | 6 | 9 | 6 | 6 | 6 | 7 | 5 | 7 | 11 | 14 | 5 | 4 | 6 |
| S316-322 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | ( 36) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| S316-322 | 2 | 1 | 10 | 10 | 0 | 0 | 21 | ( 39) | 16 | 10 | 10 | 13 | 10 | 10 | 10 | 16 | 17 | 10 | 10 | 52 | 10 | 10 | 10 |
| S316-322 | 2 | 1 | ( 13) | ( 13) | ( 0) | ( 0) | ( 36) | 1 | ( 25) | ( 13) | ( 13) | ( 32) | ( 13) | ( 13) | ( 13) | ( 19) | ( 18) | ( 25) | ( 13) | ( 69) | ( 13) | ( 13) | ( 13) |
| S316-322 | 2 | 1 | ( 19) | ( 19) | ( 0) | ( 0) | ( 46) | ( 33) | ( 37) | ( 19) | ( 19) | 19 | ( 19) | ( 19) | ( 19) | ( 23) | ( 25) | 14 | ( 20) | ( 91) | ( 20) | ( 20) | ( 20) |
| S316-322 | 2 | 1 | ( 15) | ( 15) | ( 0) | ( 0) | ( 27) | 22 | ( 28) | ( 15) | ( 15) | ( 24) | ( 15) | ( 15) | ( 15) | ( 20) | ( 23) | ( 20) | ( 15) | ( 96) | ( 15) | ( 15) | ( 15) |
| S316-322 | 2 | 1 | ( 22) | ( 22) | ( 0) | ( 0) | ( 31) | 30 | ( 38) | ( 22) | ( 22) | ( 34) | ( 22) | ( 22) | ( 22) | ( 27) | ( 23) | ( 16) | ( 25) | ( 95) | ( 25) | ( 25) | ( 25) |
| S316-322 | 2 | 1 | ( 26) | ( 26) | ( 0) | ( 0) | ( 52) | ( 32) | 40 | ( 26) | ( 26) | ( 36) | ( 26) | ( 26) | ( 26) | ( 30) | ( 31) | ( 31) | 21 | —I— | 21 | 21 | 21 |
| SCHMVETT | 3 | 0 | 3 | 3 | 0 | 0 | 8 | 11 | 9 | 9 | 3 | 7 | 3 | 3 | 3 | 3 | 3 | 3 | 7 | 30 | 10 | 5 | 5 |
| SCHMVETT | 10 | 0 | 3 | 3 | 0 | 0 | 25 | 28 | 25 | 22 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 6 | 387 | 15 | 10 | 10 |
| SCHMVETT | 100 | 0 | 3 | 3 | 0 | 0 | 46 | 34 | 28 | 61 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 6 | —S— | 48 | 10 | 18 |
| SCHMVETT | 500 | 0 | 3 | 3 | 0 | 0 | 47 | 41 | 27 | 160 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 10 | —E— | 33 | 10 | 49 |
| SCHMVETT | 1000 | 0 | 3 | 3 | 0 | 0 | 47 | 39 | 27 | 303 | 3 | 3 | 3 | 3 | 3 | 3 | 11 | 3 | 18 | —S— | 33 | 11 | 12 |
| SCHMVETT | 5000 | 0 | 3 | 3 | 0 | 0 | 46 | 38 | 27 | 1203 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 21 | —T— | 30 | 13 | 23 |
| SCHMVETT | 10000 | 0 | 3 | 3 | 0 | 0 | 47 | 37 | 28 | 2446 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 3 | 21 | —T— | 34 | 13 | 15 |
| SEMICON1 | 12 | 10 | 159 | —S— | —S— | —S— | —F— | —F— | —S— | —S— | 159 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —F— | —S— | —S— | —S— |
| SEMICON1 | 52 | 50 | 1187 | 1551 | 0 | 0 | —F— | —F— | 1671 | 1291 | 1187 | 667 | 319 | 667 | 1550 | —F— | —F— | 2547 | —F— | —F— | 1216 | 1251 | —F— |
| SEMICON1 | 102 | 100 | 841 | 2580 | —F— | 0 | —F— | —F— | 5626 | 1811 | 847 | 591 | 530 | 591 | 3828 | —F— | —F— | 2166 | —F— | —F— | 704 | 880 | —F— |
| SEMICON1 | 502 | 500 | 854 | 844 | —F— | 0 | —F— | —F— | —F— | —F— | 854 | 687 | 787 | 687 | —F— | —F— | —F— | 11073 | —F— | —F— | 881 | 757 | —F— |
| SEMICON2 | 12 | 10 | 50 | —S— | 0 | 0 | 958 | 2302 | 131 | 52 | 50 | 38 | 38 | 38 | 51 | 66 | 84 | 68 | 175 | 247 | 67 | 67 | 67 |
| SEMICON2 | 52 | 50 | 98 | 70 | 0 | 0 | 19276 | —F— | 1047 | 411 | 98 | 93 | 109 | 93 | 101 | 141 | 89 | 201 | —F— | —F— | 97 | 97 | —F— |
| SEMICON2 | 102 | 100 | 109 | 101 | 0 | 0 | 29706 | —F— | 3741 | 1077 | 109 | 109 | 109 | 109 | 109 | 116 | 111 | 369 | —F— | —F— | 115 | 115 | 115 |
| SEMICON2 | 502 | 500 | 111 | 116 | 0 | 0 | —T— | —F— | —T— | 5294 | 111 | 111 | 111 | 111 | 111 | 120 | 123 | 114 | —F— | —F— | 172 | 172 | —F— |
| SEMICON2 | 1002 | 1000 | 127 | 100 | 0 | 0 | —T— | —F— | —T— | 5067 | 127 | 127 | 127 | 127 | 127 | 129 | 140 | 136 | —F— | —F— | 196 | 196 | 196 |
| SIMPLLPA | 2 | 2 | 2 | 2 | 0 | 0 | 4 | 20 | 4 | 2 | 2 | 4 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| SIMPLLPB | 2 | 3 | 3 | 3 | 0 | 0 | 12 | 31 | 12 | 8 | 3 | 11 | 3 | 4 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| SINQUAD | 5 | 0 | 11 | 11 | 0 | 0 | 46 | 77 | 28 | 67 | 11 | 47 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 | 11 |
| SINQUAD | 50 | 0 | 104 | 104 | 0 | 0 | 56 | 57 | 86 | 105 | 115 | 97 | 11 | 11 | 13 | 123 | 121 | 117 | 175 | 157 | 111 | 111 | 111 |
| SINQUAD | 100 | 0 | 152 | 152 | 0 | 0 | 72 | 74 | 138 | 163 | 211 | 139 | 11 | 11 | 14 | 185 | 184 | 417 | 214 | 198 | 189 | 189 | 187 |
| SINQUAD | 500 | 0 | 252 | 252 | 0 | 0 | 92 | 145 | 237 | 293 | 290 | 181 | 11 | 11 | 35 | 305 | 302 | ( 444) | 279 | 262 | 297 | 297 | 302 |
| SINQUAD | 1000 | 0 | 341 | 341 | 0 | 0 | 132 | 198 | 290 | 339 | 365 | 262 | 11 | 11 | 38 | 324 | 317 | 1004 | 379 | 391 | 376 | 376 | 345 |
| SINQUAD | 5000 | 0 | ( 387) | ( 387) | 0 | 0 | ( 150) | —I— | 528 | 586 | 640 | 413 | 12 | 12 | 47 | 531 | 575 | —T— | 577 | 469 | 557 | 557 | 474 |
| SINQUAD | 10000 | 0 | 589 | 589 | 0 | 0 | 224 | —I— | 599 | 786 | 523 | —T— | 17 | 15 | —T— | 683 | 831 | —T— | 744 | 607 | 723 | 723 | 719 |
| SISSER | 2 | 0 | 7 | 9 | 0 | 0 | 5 | 0 | 11 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 12 | 7 | 8 | 5 |
| SNAIL | 2 | 0 | 71 | 71 | 0 | 0 | 151 | 132 | 133 | 71 | 71 | 133 | 80 | 71 | 72 | 84 | 61 | 96 | 111 | —I— | 92 | 174 | 168 |
| SPANHYD | 97 | 33 | 688 | 5304 | —I— | 0 | 580 | —I— | 1564 | 648 | 276 | —I— | 614 | 1983 | 554 | 386 | 689 | 803 | 1438 | —I— | —I— | 1403 | —I— |
| SPMSQRT | 28 | 0 | 10 | 18 | 0 | 0 | 44 | 66 | 36 | 34 | 10 | 12 | 10 | 12 | 10 | 15 | 11 | 31 | 12 | —I— | 10 | 12 | 13 |
| SPMSQRT | 100 | 0 | 12 | 30 | 0 | 0 | 73 | 87 | 51 | 56 | 12 | 14 | 14 | 15 | 12 | 16 | 14 | 65 | 19 | —I— | 11 | 15 | 34 |
| SPMSQRT | 499 | 0 | 17 | 42 | 0 | 0 | 113 | 131 | 94 | 130 | 17 | 19 | 19 | 18 | 16 | —I— | 20 | 330 | 28 | —S— | 21 | 18 | 53 |
| SPMSQRT | 1000 | 0 | 22 | 52 | 0 | 0 | 146 | 171 | 94 | 150 | 22 | 22 | 19 | 22 | 18 | —I— | 16 | 725 | 27 | —I— | 18 | 19 | 113 |
| SPMSQRT | 4999 | 0 | 22 | —T— | 0 | 0 | 293 | —T— | 133 | 220 | 22 | 27 | 24 | 27 | 19 | —T— | 21 | 4382 | 63 | —I— | 17 | 24 | 70 |
| SPMSQRT | 10000 | 0 | 26 | —T— | 0 | —T— | 264 | —T— | 128 | 223 | 26 | 29 | 27 | 36 | 19 | —T— | 29 | —T— | 59 | —T— | 25 | 44 | 121 |
| SROSENBR | 10 | 0 | 4 | 4 | 0 | 0 | 20 | 12 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 12 | 12 | 13 | 13 | 13 |
| SROSENBR | 50 | 0 | 4 | 4 | 0 | 0 | 20 | 12 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 12 | 12 | 13 | 13 | 13 |
| SROSENBR | 100 | 0 | 4 | 4 | 0 | 0 | 20 | 12 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 14 | 14 | 13 | 13 | 13 |
| SROSENBR | 500 | 0 | 10 | 10 | 0 | 0 | 20 | 12 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 4 | 11 | 14 | 14 | 13 | 13 | 13 |
| SROSENBR | 1000 | 0 | 10 | 10 | 0 | 0 | 20 | 12 | 8 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 4 | 11 | 14 | 14 | 13 | 13 | 13 |
| SROSENBR | 5000 | 0 | 10 | 10 | 0 | 0 | 20 | 12 | 20 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 5 | 11 | 14 | 14 | 13 | 13 | 13 |
| SROSENBR | 10000 | 0 | 10 | 10 | 0 | 0 | 20 | 12 | 20 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | —T— | 22 | 22 | 13 | 13 | 13 |
| SSEBLIN | 194 | 72 | 1360 | 1463 | —I— | —I— | 2986 | —I— | 3177 | 3583 | 1246 | —I— | 1151 | —I— | 1119 | 1309 | 1325 | 1816 | 1352 | 1384 | 1340 | 1360 | 1413 |

Number of cg-iterations ( 15 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSEBNLN | 194 | 96 | 1349 | 1418 | —I— | —I— | 3080 | —I— | 2981 | 3575 | 1361 | 1103 | 1143 | 1071 | 1231 | 1565 | 1338 | 2184 | 1340 | 1521 | 1445 | 1408 | 1398 |
| STEENBRA | 432 | 108 | 2792 | 3186 | —I— | —I— | 2022 | —I— | 2623 | 2576 | 2675 | —I— | 1013 | —I— | —I— | 3021 | 3105 | 3211 | 3010 | 2756 | 2584 | 2927 | —I— |
| STEENBRB | 468 | 108 | —I— | —I— | —I— | 0 | —I— | ( 95076) | 7784 | 4463 | 7431 | —E— | 1245 | —I— | 5706 | 3157 | —I— | 10535 | —I— | —I— | —I— | 20895 | —I— |
| STEENBRC | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 44738) | —I— | —I— | —I— | —E— | ( 3630) | —I— | 19723 | —I— | —I— | 23704 | —I— | —I— | —I— | 35992 | —I— |
| STEENBRD | 468 | 108 | —I— | 31039 | —I— | —I— | —I— | ( 97627) | ( 4927) | —I— | —I— | —E— | ( 1349) | —E— | 9484 | —I— | —I— | ( 14764) | —I— | —I— | ( 26770) | ( 19607) | —I— |
| STEENBRE | 540 | 126 | 34908 | —I— | —I— | —I— | —I— | ( 113266) | —I— | —I— | —I— | —I— | 2503 | —E— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 42614 | —I— |
| STEENBRF | 468 | 108 | —I— | —I— | —I— | 0 | —I— | ( 63237) | 1966 | 3873 | —I— | —E— | 1287 | ( 3727) | 3360 | 12934 | —I— | 5397 | —I— | —I— | 16194 | 21044 | —I— |
| STEENBRG | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 103381) | —I— | —I— | —I— | —E— | 1924 | —E— | 24894 | —I— | —I— | 21763 | —I— | —I— | —I— | ( 42188) | —I— |
| SVANBERG | 10 | 10 | 395 | 395 | —I— | 0 | 433 | 607 | 295 | 419 | 236 | 319 | 71 | 52 | 54 | 394 | 482 | 663 | 372 | 721 | 371 | 372 | 367 |
| SVANBERG | 20 | 20 | 492 | 492 | 0 | 0 | 1241 | 1079 | 639 | 587 | 496 | 380 | 104 | 82 | 106 | 482 | 470 | 977 | 575 | 998 | 560 | 560 | 569 |
| SVANBERG | 30 | 30 | 737 | 737 | 0 | 0 | 2257 | 1553 | 702 | 1102 | 473 | 460 | 212 | 110 | 204 | 602 | 601 | 1378 | 902 | 1497 | 902 | 902 | 743 |
| SVANBERG | 40 | 40 | 972 | 972 | 0 | 0 | 3363 | 1978 | 792 | 1370 | 700 | 579 | 202 | 138 | 181 | 521 | 844 | 1809 | 802 | 1667 | 824 | 824 | 835 |
| SVANBERG | 50 | 50 | 904 | 904 | —I— | 0 | 4026 | 2321 | 818 | 1627 | 755 | 739 | 338 | 156 | 261 | 928 | 826 | 1980 | 1097 | 2398 | 993 | 970 | 896 |
| SVANBERG | 60 | 60 | 914 | 914 | 0 | 0 | 4322 | 2650 | 896 | 1886 | 710 | 760 | 354 | 121 | 319 | 844 | 684 | 2331 | 892 | 2566 | 910 | 892 | 798 |
| SVANBERG | 70 | 70 | 996 | 996 | 0 | 0 | 5438 | 2870 | 1266 | 2684 | 842 | 867 | 334 | 214 | 219 | 690 | 954 | 2564 | 1298 | 3288 | 1142 | 1208 | 1252 |
| SVANBERG | 80 | 80 | 1133 | 1133 | 0 | 0 | 6635 | 3252 | 1134 | 2649 | 1189 | 739 | 425 | 154 | 267 | 1239 | 944 | 3091 | 955 | 3345 | 1086 | 1024 | 1052 |
| SVANBERG | 90 | 90 | 1179 | 1179 | 0 | 0 | 8444 | 3556 | 1274 | 4716 | 1046 | 752 | 305 | 235 | 281 | 1130 | 1292 | 3157 | 1105 | 3821 | 1199 | 1145 | 1091 |
| SVANBERG | 100 | 100 | 1673 | 1673 | 0 | 0 | 9993 | 4410 | 1725 | 4476 | 1279 | 779 | 381 | 264 | 298 | 1443 | 1250 | 3298 | 1375 | 4291 | 1396 | 1407 | 1405 |
| SVANBERG | 500 | 500 | 3226 | 3226 | —I— | —T— | 24061 | 11940 | 3706 | 27251 | 3013 | 1579 | 1273 | 1025 | 1301 | 3784 | 2737 | 13547 | 3803 | 12304 | 3937 | 3672 | 3658 |
| SVANBERG | 1000 | 1000 | 5340 | 5340 | —I— | —T— | —T— | 20183 | 6828 | —T— | 4225 | 2213 | 2588 | 1376 | 2425 | 3626 | 3863 | 24325 | 6273 | 15584 | 6180 | 5556 | 6627 |
| SVANBERG | 5000 | 5000 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| TAME | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TENBARS1 | 18 | 9 | 8179 | 6337 | —I— | —I— | 5606 | —I— | —S— | 3493 | —S— | 5814 | —I— | 550 | 2752 | —S— | 4815 | —S— | —I— | —I— | 3972 | —S— | —I— |
| TENBARS2 | 18 | 8 | 2661 | 4555 | —I— | —I— | 2596 | —I— | 4157 | 2378 | 2421 | 1912 | —I— | 585 | 2836 | —S— | 2410 | 5248 | 4494 | —I— | 2574 | 2233 | —I— |
| TENBARS3 | 18 | 8 | 1517 | 3376 | —I— | —I— | 1441 | —I— | 3128 | 1558 | 2003 | 1581 | —I— | 498 | 2641 | 1206 | 1567 | 7062 | 2913 | —I— | 1473 | 1642 | —I— |
| TENBARS4 | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| TOINTGOR | 50 | 0 | 75 | 104 | 0 | 0 | 117 | 138 | 107 | 102 | 79 | 41 | 7 | 7 | 38 | 76 | 84 | 97 | 75 | 75 | 75 | 75 | 75 |
| TOINTGSS | 10 | 0 | 2 | 2 | 0 | 0 | 55 | 52 | ( 26) | 2 | 2 | 2 | 2 | 2 | 2 | 14 | ( 9) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 50 | 0 | 2 | 2 | 0 | 0 | ( 29) | 29 | ( 23) | 2 | 2 | 2 | 2 | 2 | 2 | 12 | ( 7) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 100 | 0 | 2 | 2 | 0 | 0 | ( 19) | ( 59) | ( 17) | 2 | 2 | 2 | 2 | 2 | 2 | ( 7) | ( 13) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 500 | 0 | 2 | 2 | 0 | 0 | ( 15) | ( 22) | ( 8) | 2 | 2 | 2 | 2 | 2 | 2 | 10 | ( 10) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 1000 | 0 | 2 | 2 | 0 | 0 | ( 15) | ( 14) | ( 7) | 2 | 2 | 2 | 2 | 2 | 2 | 13 | ( 7) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 5000 | 0 | 2 | 2 | 0 | 0 | ( 13) | ( 16) | ( 6) | 2 | 2 | 2 | 2 | 2 | 2 | 14 | ( 10) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 10000 | 0 | 2 | 2 | 0 | 0 | 13 | ( 15) | ( 6) | 2 | 2 | 2 | 2 | 2 | 2 | 8 | 10 | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTPSP | 50 | 0 | 65 | 65 | 0 | 0 | 85 | 86 | 76 | 74 | 64 | 37 | 14 | 14 | 14 | 74 | 78 | 141 | 65 | 65 | 65 | 65 | 65 |
| TOINTQOR | 50 | 0 | 24 | 30 | 0 | 0 | 34 | 53 | 27 | 30 | 16 | 12 | 4 | 4 | 7 | 24 | 25 | 35 | 24 | 24 | 24 | 24 | 24 |
| TORSIONA | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONA | 100 | 0 | 8 | 9 | 0 | 0 | 12 | 12 | 11 | 10 | 2 | 2 | 2 | 2 | 3 | 8 | 8 | 8 | 15 | 48 | 15 | 15 | 17 |
| TORSIONA | 484 | 0 | 40 | 55 | 0 | 0 | 62 | 56 | 57 | 42 | 35 | 6 | 6 | 6 | 7 | 40 | 41 | 41 | 43 | 287 | 43 | 43 | 45 |
| TORSIONA | 1024 | 0 | 83 | 91 | 0 | 0 | 131 | 116 | 116 | 84 | 77 | 9 | 9 | 9 | 13 | 83 | 73 | 77 | 96 | 959 | 95 | 95 | 64 |
| TORSIONA | 5476 | 0 | 442 | 319 | 0 | 0 | 691 | 593 | 592 | 444 | 434 | 23 | 23 | 23 | 66 | 442 | 330 | 313 | 250 | —I— | 251 | 244 | 251 |
| TORSIONA | 10000 | 0 | 784 | 465 | 0 | 0 | 1243 | 1044 | 1067 | 786 | 776 | 31 | 31 | 31 | 117 | 784 | 577 | 553 | 429 | —I— | 429 | 427 | 429 |
| TORSIONA | 14884 | 0 | 1147 | 1015 | 0 | 0 | 1830 | 1508 | 1532 | 1149 | 1139 | 37 | 37 | 37 | 175 | 1147 | 827 | 775 | 508 | —T— | 508 | 507 | 507 |
| TORSIONB | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONB | 100 | 0 | 14 | 14 | 0 | 0 | 17 | 16 | 15 | 15 | 3 | 3 | 3 | 3 | 10 | 11 | 12 | 13 | 17 | 39 | 15 | 17 | 17 |
| TORSIONB | 484 | 0 | 70 | 90 | 0 | 0 | 72 | 73 | 68 | 70 | 70 | 26 | 26 | 26 | 52 | 87 | 109 | 72 | 65 | 243 | 65 | 65 | 65 |
| TORSIONB | 1024 | 0 | 124 | 141 | 0 | 0 | 137 | 106 | 124 | 117 | 124 | 74 | 74 | 74 | 101 | 205 | 292 | 114 | 143 | 533 | 143 | 143 | 143 |
| TORSIONB | 5476 | 0 | 655 | 711 | 0 | 0 | 741 | 526 | 677 | 655 | 655 | 491 | 491 | 491 | 606 | 1439 | 1618 | 611 | 545 | —I— | 545 | 545 | 545 |
| TORSIONB | 10000 | 0 | 1323 | 1258 | 0 | 0 | 1385 | 855 | 1251 | 1309 | 1323 | 871 | 871 | 871 | 986 | 2693 | 3005 | 1286 | 994 | —I— | 994 | 994 | 994 |
| TORSIONB | 14884 | 0 | 2025 | 1970 | —T— | —I— | 2266 | 1503 | 2092 | 1970 | 2025 | 1377 | 1377 | 1377 | —T— | —T— | —T— | 1940 | 1541 | —T— | 1541 | 1541 | 1541 |
| TORSIONC | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONC | 100 | 0 | 1 | 1 | 0 | 0 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 5 | 3 | 3 | 3 |
| TORSIONC | 484 | 0 | 12 | 19 | 0 | 0 | 18 | 17 | 17 | 14 | 3 | 3 | 3 | 3 | 4 | 12 | 13 | 13 | 48 | 83 | 49 | 48 | 32 |
| TORSIONC | 1024 | 0 | 22 | 31 | 0 | 0 | 35 | 31 | 32 | 23 | 17 | 4 | 4 | 4 | 5 | 22 | 22 | 23 | 43 | 163 | 43 | 43 | 45 |
| TORSIONC | 5476 | 0 | 128 | 102 | 0 | 0 | 195 | 173 | 174 | 130 | 120 | 11 | 11 | 11 | 20 | 128 | 102 | 100 | 204 | —I— | 202 | 203 | 205 |
| TORSIONC | 10000 | 0 | 230 | 157 | 0 | 0 | 355 | 307 | 312 | 232 | 222 | 15 | 15 | 15 | 36 | 230 | 178 | 167 | 144 | —I— | 144 | 144 | 144 |
| TORSIONC | 14884 | 0 | 332 | 293 | 0 | 0 | 519 | 446 | 457 | 334 | 325 | 19 | 19 | 19 | 52 | 332 | 252 | 237 | 397 | —I— | 397 | 397 | 396 |
| TORSIOND | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIOND | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 1 | 5 | 1 | 1 | 1 |

Number of cg-iterations ( 16 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TORSIOND | 484 | 0 | 20 | 24 | 0 | 0 | 24 | 21 | 22 | 19 | 7 | 5 | 5 | 5 | 19 | 93 | 198 | 19 | 17 | 89 | 17 | 17 | 17 |
| TORSIOND | 1024 | 0 | 42 | 43 | 0 | 0 | 54 | 44 | 50 | 41 | 38 | 13 | 13 | 13 | 36 | 258 | 619 | 38 | 49 | 259 | 49 | 49 | 50 |
| TORSIOND | 5476 | 0 | 202 | 212 | 0 | 0 | 280 | 190 | 237 | 199 | 203 | 59 | 59 | 59 | 138 | 2862 | 3387 | 164 | 286 | —I— | 286 | 286 | 286 |
| TORSIOND | 10000 | 0 | 381 | 329 | 0 | 0 | 518 | 317 | 445 | 386 | 382 | 149 | 149 | 149 | 245 | 5294 | —T— | 310 | 298 | —I— | 298 | 298 | 298 |
| TORSIOND | 14884 | 0 | 652 | 551 | 0 | 0 | 759 | 445 | 658 | 652 | 652 | 315 | 315 | 315 | 445 | —T— | —T— | 551 | 452 | —I— | 452 | 452 | 452 |
| TORSIONE | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 484 | 0 | 1 | 1 | 0 | 0 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 10 | 3 | 3 | 3 |
| TORSIONE | 1024 | 0 | 7 | 10 | 0 | 0 | 12 | 11 | 11 | 9 | 2 | 2 | 2 | 2 | 3 | 7 | 7 | 7 | 8 | 75 | 8 | 8 | 8 |
| TORSIONE | 5476 | 0 | 41 | 39 | 0 | 0 | 63 | 56 | 56 | 43 | 35 | 6 | 6 | 6 | 6 | 41 | 36 | 31 | 63 | 304 | 62 | 63 | 40 |
| TORSIONE | 10000 | 0 | 70 | 54 | 0 | 0 | 107 | 95 | 95 | 72 | 62 | 8 | 8 | 8 | 8 | 70 | 59 | 57 | 59 | 764 | 60 | 59 | 62 |
| TORSIONE | 14884 | 0 | 93 | 73 | 0 | 0 | 145 | 127 | 130 | 95 | 87 | 9 | 9 | 9 | 13 | 93 | 79 | 69 | 369 | —I— | 386 | 370 | 401 |
| TORSIONF | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONF | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONF | 484 | 0 | 2 | 2 | 0 | 0 | 3 | 4 | 3 | 4 | 2 | 2 | 2 | 2 | 10 | 28 | 24 | 2 | 1 | 8 | 1 | 1 | 1 |
| TORSIONF | 1024 | 0 | 12 | 15 | 0 | 0 | 17 | 14 | 16 | 13 | 3 | 3 | 3 | 3 | 10 | 169 | 305 | 11 | 10 | 99 | 10 | 10 | 10 |
| TORSIONF | 5476 | 0 | 54 | 49 | 0 | 0 | 83 | 57 | 73 | 54 | 54 | 12 | 12 | 12 | 38 | 1952 | 3202 | 43 | 65 | 494 | 65 | 65 | 65 |
| TORSIONF | 10000 | 0 | 111 | 101 | 0 | 0 | 143 | 85 | 120 | 110 | 112 | 30 | 30 | 30 | 55 | 4280 | 1524 | 86 | 90 | 791 | 90 | 90 | 91 |
| TORSIONF | 14884 | 0 | 154 | 149 | 0 | 0 | 207 | 127 | 180 | 154 | 155 | 69 | 69 | 69 | 107 | —T— | —T— | 124 | 136 | —I— | 136 | 136 | 136 |
| TQUARTIC | 5 | 0 | 1 | 1 | 0 | 0 | 8 | 3 | 2 | 8 | 1 | 6 | 1 | 1 | 1 | 1 | 12 | 1 | 1 | 1 | 1 | 1 | 1 |
| TQUARTIC | 10 | 0 | 14 | 14 | 0 | 0 | 8 | 5 | 2 | 11 | 1 | 10 | 1 | 1 | 1 | 14 | 25 | 13 | 14 | 11 | 14 | 14 | 14 |
| TQUARTIC | 50 | 0 | 25 | 25 | 0 | 0 | 8 | 16 | 2 | 17 | 29 | 29 | 1 | 1 | 1 | 34 | 22 | 14 | 25 | 18 | 25 | 25 | 25 |
| TQUARTIC | 100 | 0 | 23 | 23 | 0 | 0 | 10 | 26 | 2 | 17 | 21 | 21 | 1 | 1 | 1 | 24 | 23 | 12 | 22 | 17 | 22 | 22 | 22 |
| TQUARTIC | 500 | 0 | 27 | 27 | 0 | 0 | 14 | 60 | 2 | 21 | 24 | 3 | 1 | 1 | 1 | 27 | 34 | 13 | 27 | 26 | 27 | 27 | 27 |
| TQUARTIC | 1000 | 0 | 24 | 24 | 0 | 0 | 14 | 86 | 2 | 32 | 28 | 3 | 1 | 1 | 1 | 24 | 25 | 13 | 24 | 23 | 24 | 24 | 24 |
| TQUARTIC | 5000 | 0 | 31 | 31 | 0 | —T— | 12 | 196 | 2 | 24 | 34 | 3 | 1 | 1 | 1 | 31 | 60 | 27 | 32 | 29 | 32 | 32 | 32 |
| TQUARTIC | 10000 | 0 | 26 | 26 | 0 | —T— | 12 | 278 | 2 | 24 | 44 | 3 | 1 | 1 | 1 | 26 | 143 | 27 | 26 | 25 | 26 | 26 | 26 |
| TRIDIA | 10 | 0 | 1 | 1 | 0 | 0 | 24 | 54 | 24 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 20 | 0 | 1 | 1 | 0 | 0 | 46 | 69 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 30 | 0 | 1 | 1 | 0 | 0 | 57 | 96 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 50 | 0 | 1 | 1 | 0 | 0 | 75 | 121 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 100 | 0 | 1 | 1 | 0 | 0 | 91 | 140 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 500 | 0 | 1 | 1 | 0 | 0 | 91 | 99 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 1000 | 0 | 1 | 1 | 0 | 0 | 91 | 473 | 25 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 5000 | 0 | 1 | 1 | 0 | 0 | 91 | 242 | 25 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 10000 | 0 | 1 | 1 | 0 | 0 | 91 | 330 | 25 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIGGER | 7 | 6 | 22 | —F— | 0 | 0 | —S— | —I— | —I— | —I— | 22 | 17 | 13 | 22 | 75 | 22 | —S— | 42 | 24 | 20 | 24 | 24 | 24 |
| VARDIM | 10 | 0 | 0 | 44 | 0 | 0 | 0 | 53 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARDIM | 50 | 0 | 0 | 184 | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| VARDIM | 100 | 0 | 0 | 324 | 0 | 0 | 0 | —I— | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| VAREIGVL | 10 | 0 | 75 | 75 | 0 | 0 | 53 | 166 | 58 | 61 | 28 | 26 | 37 | 23 | 29 | 69 | 40 | 81 | 40 | 21 | 55 | 54 | 49 |
| VAREIGVL | 50 | 0 | 66 | 67 | 0 | 0 | 109 | 248 | 113 | 104 | 36 | 17 | 13 | 13 | 31 | 66 | 58 | 63 | 35 | 30 | 60 | 82 | 64 |
| VAREIGVL | 100 | 0 | 72 | 62 | 0 | 0 | 81 | 186 | 79 | 93 | 35 | 15 | 12 | 12 | 31 | 72 | 88 | 67 | 52 | —I— | 70 | 84 | 105 |
| VAREIGVL | 500 | 0 | 51 | 70 | 0 | 0 | 98 | 101 | 68 | 66 | 31 | 14 | 11 | 11 | 22 | 51 | 49 | 47 | 44 | —I— | 45 | 48 | 98 |
| VAREIGVL | 1000 | 0 | 58 | 67 | 0 | 0 | 124 | 77 | 67 | 60 | 30 | 16 | 12 | 12 | 25 | 58 | 51 | 57 | 56 | —I— | 55 | 59 | 84 |
| VAREIGVL | 5000 | 0 | 46 | 67 | —M— | —M— | 102 | 72 | 59 | 56 | 26 | —M— | —M— | —M— | —M— | 46 | 46 | 41 | 47 | —T— | 51 | 59 | 95 |
| WATSON | 12 | 0 | 35 | 73 | —I— | 0 | 41 | 46 | 42 | 36 | 29 | 31 | 29 | 8 | 11 | 36 | 29 | 40 | 859 | 859 | 84 | 65 | 73 |
| WATSON | 31 | 0 | 47 | 5935 | —I— | 0 | 46 | 2542 | 46 | 64 | 47 | 35 | 13 | 65 | 36 | 47 | 55 | 88 | 107 | 107 | 73 | 56 | 54 |
| WOODS | 4 | 0 | 17 | 27 | 0 | 0 | 47 | 297 | 36 | 25 | 17 | 35 | 17 | 17 | 17 | 25 | 18 | 23 | 10 | 10 | 17 | 17 | 17 |
| WOODS | 100 | 0 | 20 | 29 | 0 | 0 | 76 | 298 | 37 | 28 | 20 | 20 | 20 | 20 | 20 | 25 | 22 | 23 | 10 | 10 | 20 | 20 | 20 |
| WOODS | 1000 | 0 | 24 | 27 | 0 | 0 | 72 | 298 | 54 | 30 | 24 | 24 | 24 | 24 | 24 | 25 | 18 | 35 | 10 | 10 | 24 | 24 | 24 |
| WOODS | 10000 | 0 | 24 | 27 | 0 | —T— | 73 | 298 | 58 | 35 | 24 | 24 | 24 | 24 | 24 | 22 | 21 | —T— | 13 | 13 | 24 | 24 | 24 |
| ZANGWIL2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ZANGWIL3 | 3 | 0 | 2 | 2 | 0 | 0 | 3 | 24 | 3 | 7 | 2 | 3 | 2 | 2 | 2 | 6 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| ZIGZAG | 64 | 50 | 659 | 659 | —I— | 0 | 750 | 681 | 756 | 607 | 393 | 262 | 215 | 112 | 246 | 797 | 658 | 990 | 672 | 878 | 729 | 1009 | 871 |
| ZIGZAG | 304 | 250 | 16021 | 25554 | —I— | —I— | 154079 | 33440 | 21384 | 21043 | 7952 | 4215 | 2472 | —I— | 2934 | 16034 | 16476 | 17208 | 30048 | 31810 | 17227 | 15902 | 16233 |
| ZIGZAG | 604 | 500 | 30548 | —I— | —I— | —I— | —T— | 185582 | 62820 | 83197 | 10160 | 4498 | 4598 | —I— | 5685 | 29846 | 29638 | 32123 | —S— | —S— | 30888 | 29425 | 29882 |
| ZIGZAG | 3004 | 2500 | —T— | —T— | —T— | —T— | —T— | —I— | —T— | —T— | 10699 | —T— | 12860 | —T— | 16220 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |

# 6 Computational effort

This section presents the cpu-times for the 21 algorithmic variants on all test problems. The times were measured on a DECstation 5000/200 under the f77 (version 3.0-2) compiler without optimization. They are rounded to the nearest second. The column headings in the tables refer to these variants, using the terminology of the paper. Other conventions are as in the previous sections.

Cputimes (in seconds) ( 1 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AGG | 163 | 488 | —T— | —T— | —I— | —I— | —T— | —I— | —S— | —S— | —T— | —I— | —S— | —I— | —T— | —S— | —I— | —S— | —T— | —T— | —T— | —T— | —T— |
| AIRCRFTA | 8 | 5 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 |
| AIRCRFTB | 8 | 0 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | —S— | 2 | 2 | 2 |
| ALJAZZAF | 3 | 1 | 2 | 2 | 2 | 1 | 2 | —I— | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | —I— | 3 | 3 | 3 |
| ARGAUSS | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINA | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINA | 100 | 0 | 11 | 11 | 2 | 2 | 2 | 4 | 10 | 10 | 12 | 24 | 121 | 122 | 123 | 18 | 30 | 11 | 11 | 11 | 11 | 11 | 11 |
| ARGLINB | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINB | 50 | 0 | 4 | —S— | 3 | 3 | 3 | —I— | 4 | 4 | 4 | 5 | 11 | 11 | 11 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 4 |
| ARGLINB | 100 | 0 | 25 | —S— | 16 | 17 | 16 | —I— | 24 | 24 | 26 | 39 | 136 | 735 | 137 | —S— | —S— | 25 | 25 | 25 | 25 | 25 | 25 |
| ARGLINC | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 34 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ARGLINC | 50 | 0 | 3 | —S— | 2 | 2 | 2 | —I— | 4 | 3 | 4 | 5 | 10 | 10 | 10 | 3 | 4 | 4 | 4 | 3 | 4 | 3 | 3 |
| ARGLINC | 100 | 0 | 24 | —S— | 16 | 16 | 16 | —I— | 23 | 23 | 25 | 38 | 127 | 1025 | 128 | —S— | —S— | 24 | 24 | 24 | 24 | 24 | 24 |
| ARGTRIG | 10 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARGTRIG | 50 | 0 | 10 | 9 | 62 | 21 | 21 | 9 | 20 | 22 | 8 | 16 | 22 | 27 | 37 | 10 | 16 | 9 | 6 | 6 | 7 | 7 | 8 |
| ARGTRIG | 100 | 0 | 82 | 82 | 509 | 263 | 196 | 27 | 95 | 131 | 74 | 122 | 257 | 320 | 387 | 83 | 88 | 52 | 32 | 32 | 32 | 32 | 33 |
| ARTIF | 12 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARTIF | 52 | 0 | 2 | 2 | 3 | 5 | 6 | 2 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 1 |
| ARTIF | 102 | 0 | 6 | 6 | 7 | 15 | 507 | 16 | 4 | 5 | 7 | 12 | 10 | 12 | 7 | 6 | 5 | 19 | 7 | 6 | 4 | 4 | 4 |
| ARTIF | 502 | 0 | 18 | 20 | 60 | 1155 | 81 | 23 | 13 | 16 | 24 | 43 | 34 | 44 | 24 | 16 | 15 | 133 | 25 | 24 | 13 | 13 | 13 |
| ARTIF | 1002 | 0 | 34 | 42 | 188 | 4296 | 147 | 53 | 24 | 29 | 45 | 70 | 67 | 70 | 47 | 31 | 26 | 385 | 45 | 43 | 24 | 24 | 25 |
| ARTIF | 5002 | 0 | 162 | 224 | 2147 | —T— | 766 | 277 | 115 | 140 | 219 | 480 | 312 | 478 | 218 | 164 | 185 | 4330 | 226 | 214 | 111 | 110 | 115 |
| ARWHEAD | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| ARWHEAD | 500 | 0 | 3 | 3 | 4 | 5 | 3 | 29 | 3 | 3 | 5 | 5 | 10 | 10 | 6 | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 7 |
| ARWHEAD | 1000 | 0 | 7 | 7 | 10 | 10 | 6 | 76 | 6 | 7 | 9 | 13 | 30 | 31 | 18 | 8 | 7 | 8 | 7 | 7 | 7 | 7 | 7 |
| ARWHEAD | 5000 | 0 | 70 | 69 | 181 | 180 | 61 | 738 | 65 | 66 | 80 | 206 | 651 | 650 | 350 | 72 | 69 | 73 | 74 | 73 | 72 | 72 | 88 |
| BARD | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | —I— | 1 | 1 | 1 |
| BDEXP | 100 | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 4 | 5 |
| BDEXP | 500 | 0 | ( 6) | ( 7) | ( 8) | ( 8) | ( 4) | 5 | ( 9) | ( 14) | ( 8) | ( 9) | ( 9) | ( 8) | ( 7) | ( 6) | ( 7) | ( 7) | 12 | 12 | ( 11) | 16 | ( 18) |
| BDEXP | 1000 | 0 | ( 12) | ( 14) | ( 15) | ( 18) | ( 8) | 8 | ( 18) | ( 28) | ( 18) | ( 17) | ( 17) | ( 16) | ( 14) | ( 13) | ( 15) | ( 14) | ( 22) | 23 | ( 20) | ( 29) | ( 33) |
| BDEXP | 5000 | 0 | ( 59) | ( 71) | ( 75) | ( 77) | ( 37) | ( 46) | ( 81) | ( 140) | ( 98) | ( 82) | ( 81) | ( 80) | ( 69) | ( 62) | ( 71) | ( 69) | ( 106) | 112 | ( 99) | ( 328) | ( 177) |
| BDQRTIC | 100 | 0 | 3 | 2 | 4 | 4 | 3 | 22 | 3 | 3 | 4 | 4 | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| BDQRTIC | 500 | 0 | 12 | 10 | 34 | 34 | 14 | 170 | 11 | 11 | 15 | 20 | 42 | 42 | 34 | 12 | 13 | 13 | 11 | 11 | 11 | 11 | 15 |
| BDQRTIC | 1000 | 0 | 23 | 21 | 132 | 134 | 29 | 467 | 22 | 22 | 28 | 49 | 134 | 136 | 104 | 26 | 26 | 26 | 25 | 24 | 24 | 24 | —S— |
| BDVALUE | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BDVALUE | 52 | 0 | 0 | 0 | 0 | 0 | 9 | 6 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BDVALUE | 102 | 0 | 0 | 0 | 0 | 0 | 3 | 3 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BDVALUE | 502 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 1002 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BDVALUE | 5002 | 0 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| BEALE | 2 | 0 | 1 | —E— | 0 | 1 | 1 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| BIGBANK | 2230 | 1112 | —T— | —T— | 14932 | 8475 | —T— | —I— | —T— | —T— | —T— | —T— | 4769 | 4411 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| BIGGS3 | 6 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | —S— | 1 | 2 | 2 |
| BIGGS5 | 6 | 0 | 5 | 3 | —I— | 4 | 2 | 4 | 5 | ( 5) | 4 | 4 | 4 | 6 | 5 | 5 | 3 | 3 | 5 | —I— | ( 27) | 3 | 4 |
| BIGGS6 | 6 | 0 | 10 | 3 | 15 | 8 | 2 | —I— | 6 | 3 | 11 | 4 | 14 | 10 | ( 9) | 9 | 5 | 8 | ( 17) | —I— | 9 | 6 | 9 |
| BOOTH | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BOX2 | 3 | 0 | 1 | 1 | 0 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| BOX3 | 3 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| BQPGAUSS | 2003 | 0 | 1574 | —S— | —I— | 249 | 4722 | 4063 | 1592 | 1687 | 2343 | 4882 | 306 | 322 | 443 | 2068 | 1670 | 1989 | —I— | —S— | 2928 | 1994 | —I— |
| BRATU1D | 13 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | —S— | —S— | 1 | 1 | 38 |
| BRATU1D | 77 | 0 | 1 | 1 | 1 | 1 | 6 | 37 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | —I— | —I— | 3 | 2 | —I— |
| BRATU1D | 103 | 0 | 2 | 1 | 2 | 2 | 10 | —I— | 10 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | —I— | —I— | 3 | 3 | —I— |
| BRATU1D | 503 | 0 | 7 | 6 | 7 | —E— | 230 | —I— | 245 | 6 | 9 | 10 | 9 | 9 | 8 | 8 | 9 | 9 | —E— | —I— | —E— | 11 | —E— |
| BRATU1D | 1003 | 0 | 15 | —E— | 14 | 15 | 909 | —I— | 1075 | 13 | 19 | 18 | 18 | 18 | 16 | 17 | 20 | 20 | —E— | —I— | —E— | 23 | —E— |
| BRATU2D | 49 | 25 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BRATU2D | 100 | 64 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BRATU2D | 484 | 400 | 14 | 23 | 5 | 5 | 8 | 16 | 9 | 12 | 18 | 5 | 6 | 5 | 13 | 15 | 17 | 15 | 15 | 15 | 14 | 15 | 15 |
| BRATU2D | 1024 | 900 | 46 | 88 | 15 | 16 | 35 | 71 | 38 | 38 | 59 | 15 | 17 | 15 | 43 | 47 | 71 | 46 | 46 | 46 | 46 | 46 | 55 |
| BRATU2D | 5184 | 4900 | 1008 | 1824 | —F— | —F— | —F— | 1329 | 966 | 873 | 1291 | —F— | —F— | —F— | 202 | 1014 | 1722 | 1021 | 1016 | 1010 | 1011 | 1009 | 1022 |

Cputimes (in seconds) ( 2 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BRATU3D | 27 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BRATU3D | 125 | 27 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BRATU3D | 512 | 216 | 4 | 4 | 8 | 9 | 2 | 4 | 3 | 3 | 4 | 9 | 9 | 9 | 8 | 4 | 5 | 5 | 4 | 4 | 4 | 4 | 4 |
| BRATU3D | 1000 | 512 | 10 | 13 | 40 | 44 | 8 | 13 | 8 | 9 | 10 | 41 | 45 | 41 | 20 | 10 | 13 | 11 | 10 | 10 | 10 | 10 | 11 |
| BRATU3D | 4913 | 3375 | 168 | 190 | 3588 | 3846 | 138 | 207 | 135 | 135 | 211 | 3605 | 3861 | 3614 | 202 | 177 | 207 | 176 | 170 | 169 | 169 | 169 | 170 |
| BRIDGEND | 2734 | 2727 | —T— | —I— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —I— | —T— | 895 | —T— | —T— | —T— | —T— | —I— | —I— | —T— | —T— | —I— |
| BRITGAS | 450 | 360 | 1199 | 1121 | —I— | —I— | 1677 | 338 | 220 | 418 | 1075 | 2054 | 780 | 192 | 552 | 762 | 642 | 731 | —I— | —I— | 779 | 2527 | —I— |
| BRKMCC | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| BROWNAL | 10 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BROWNAL | 50 | 0 | 3 | 3 | 9 | 9 | 1 | 2 | 2 | 4 | 4 | 10 | 23 | 14 | 15 | 3 | 4 | 4 | 5 | 4 | 4 | 4 | 5 |
| BROWNBS | 2 | 0 | 3 | 2 | —I— | —I— | 2 | 4 | 2 | 3 | 3 | 2 | 4 | 4 | 4 | 3 | 2 | 2 | 7 | —I— | 3 | 3 | 3 |
| BROWNDEN | 4 | 0 | 1 | 1 | 7 | 7 | 1 | —I— | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 7 | 1 | 1 | —I— |
| BROYDN3D | 10 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| BROYDN3D | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BROYDN3D | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| BROYDN3D | 500 | 0 | 3 | 3 | 4 | 4 | 3 | 5 | 4 | 3 | 4 | 5 | 5 | 5 | 4 | 5 | 3 | 3 | 3 | 3 | 5 | 5 | 5 |
| BROYDN3D | 1000 | 0 | 6 | 6 | 8 | 8 | 7 | 10 | 8 | 5 | 8 | 8 | 9 | 9 | 7 | 9 | 7 | 6 | 5 | 5 | 9 | 9 | 9 |
| BROYDN3D | 5000 | 0 | 28 | 28 | 38 | 38 | 30 | 45 | 35 | 28 | 38 | 41 | 43 | 41 | 36 | 31 | 36 | 31 | 24 | 24 | 43 | 43 | 46 |
| BROYDN3D | 10000 | 0 | 56 | 57 | 75 | 78 | 60 | 90 | 66 | 55 | 77 | 82 | 84 | 83 | 72 | 62 | 67 | 61 | 48 | 50 | 76 | 76 | 82 |
| BROYDN7D | 10 | 0 | 1 | 1 | ( 2) | 2 | 2 | ( 3) | ( 2) | 2 | 2 | 2 | 2 | ( 2) | ( 2) | 2 | 1 | 1 | ( 5) | ( 6) | 2 | 2 | 2 |
| BROYDN7D | 50 | 0 | ( 4) | ( 3) | ( 7) | ( 3) | ( 3) | ( 3) | ( 3) | 4 | ( 4) | ( 5) | ( 4) | ( 5) | ( 5) | ( 3) | ( 2) | ( 3) | ( 7) | ( 8) | ( 3) | ( 3) | ( 3) |
| BROYDN7D | 100 | 0 | ( 5) | ( 4) | ( 13) | ( 8) | ( 4) | ( 5) | ( 5) | 8 | ( 6) | ( 10) | ( 8) | ( 12) | ( 11) | ( 6) | ( 6) | ( 7) | ( 12) | ( 14) | ( 6) | ( 6) | ( 6) |
| BROYDN7D | 500 | 0 | ( 48) | ( 46) | ( 111) | ( 164) | ( 43) | ( 53) | ( 50) | 55 | ( 61) | ( 107) | ( 37) | ( 119) | ( 99) | ( 42) | ( 39) | ( 118) | ( 85) | ( 95) | ( 36) | ( 35) | ( 43) |
| BROYDN7D | 1000 | 0 | ( 143) | ( 140) | ( 284) | ( 1863) | ( 141) | ( 200) | ( 163) | 99 | ( 187) | ( 347) | ( 88) | ( 187) | ( 47) | ( 142) | ( 137) | ( 424) | ( 276) | ( 313) | ( 130) | ( 135) | ( 145) |
| BROYDNBD | 10 | 10 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| BROYDNBD | 50 | 50 | 3 | 2 | 4 | 5 | 3 | 4 | 3 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 3 |
| BROYDNBD | 100 | 100 | 4 | 4 | 7 | 5 | 5 | 7 | 3 | 4 | 5 | 9 | 7 | 9 | 6 | 4 | 4 | 9 | 5 | 5 | 4 | 4 | 5 |
| BROYDNBD | 500 | 500 | 21 | 20 | 45 | 25 | 22 | 24 | 16 | 14 | 19 | 40 | 24 | 40 | 30 | 18 | 20 | 19 | 20 | 22 | 20 | 20 | 23 |
| BROYDNBD | 1000 | 1000 | 43 | 42 | 101 | 45 | 66 | 45 | 32 | 33 | 38 | 136 | 51 | 135 | 60 | 39 | 33 | 259 | 40 | 44 | 40 | 39 | 43 |
| BROYDNBD | 5000 | 5000 | 393 | 394 | 355 | 260 | 419 | 213 | 114 | 154 | 336 | 896 | 270 | 904 | 396 | —F— | 528 | 10457 | 180 | 204 | 179 | 178 | 201 |
| CBRATU2D | 32 | 8 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 |
| CBRATU2D | 98 | 50 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CBRATU2D | 512 | 392 | 9 | 12 | 5 | 6 | 7 | 14 | 8 | 8 | 12 | 6 | 6 | 6 | 10 | 10 | 13 | 9 | 10 | 11 | 10 | 10 | 11 |
| CBRATU2D | 1058 | 882 | 40 | 57 | 15 | 17 | 32 | 52 | 33 | 35 | 50 | 16 | 18 | 16 | 29 | 42 | 56 | 40 | 40 | 43 | 40 | 41 | 46 |
| CBRATU3D | 54 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 |
| CBRATU3D | 128 | 16 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| CBRATU3D | 686 | 250 | 4 | 4 | 8 | 9 | 3 | 5 | 3 | 3 | 5 | 8 | 9 | 8 | 8 | 5 | 4 | 4 | 4 | 5 | 4 | 4 | 5 |
| CBRATU3D | 2000 | 1024 | 21 | 28 | 84 | 96 | 16 | 26 | 18 | 20 | 25 | 86 | 95 | 86 | 41 | 24 | 28 | 24 | 21 | 23 | 21 | 21 | 24 |
| CHANDHEQ | 10 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 3 | 2 | 2 | 5 |
| CHANDHEQ | 50 | 0 | 25 | 25 | 68 | 74 | 22 | 15 | 22 | 23 | 26 | 62 | 73 | 71 | 71 | 25 | 24 | 26 | 29 | 32 | 29 | 28 | 53 |
| CHANDHEQ | 100 | 0 | 137 | 121 | 834 | 857 | 104 | 59 | 112 | 115 | 131 | 698 | 849 | 841 | 850 | 125 | 123 | 129 | 137 | 150 | 137 | 136 | 192 |
| CHEBYQAD | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 1 |
| CHEBYQAD | 4 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| CHEBYQAD | 5 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| CHEBYQAD | 6 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CHEBYQAD | 7 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| CHEBYQAD | 8 | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 7 | 6 | 1 | 1 | 1 |
| CHEBYQAD | 9 | 0 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 1 | 4 | 3 | 2 | 2 | 2 |
| CHEBYQAD | 10 | 0 | 3 | 2 | ( 2) | 3 | ( 2) | ( 2) | ( 2) | ( 2) | 2 | 3 | 2 | 2 | 3 | 3 | 1 | ( 2) | 14 | 13 | 3 | 3 | 3 |
| CHEBYQAD | 20 | 0 | 9 | 7 | 18 | 9 | 5 | 22 | 5 | 8 | 7 | 22 | 11 | 11 | 15 | 7 | 7 | 11 | 25 | 26 | 9 | 9 | 8 |
| CHEBYQAD | 50 | 0 | 147 | 205 | 805 | 4762 | 54 | 91 | 63 | 112 | 140 | 657 | 383 | 500 | 827 | 131 | 114 | 107 | —I— | —I— | 112 | 111 | 123 |
| CHEMRCTA | 10 | 10 | 1 | 1 | 1 | 1 | 1 | 8 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CHEMRCTA | 50 | 50 | 5 | 4 | 3 | 4 | —F— | —F— | —F— | 271 | 6 | 3 | 10 | 5 | —F— | 5 | 4 | 4 | 6 | 4 | 4 | 5 | 5 |
| CHEMRCTA | 100 | 100 | 26 | 15 | 237 | 14 | —F— | —F— | —F— | —S— | 27 | 8 | —F— | 17 | —F— | 22 | 20 | 31 | 17 | 19 | 15 | 17 | 19 |
| CHEMRCTA | 500 | 500 | —T— | —F— | —F— | —F— | —T— | —F— | —T— | —T— | —T— | 193 | —F— | 232 | —T— | —F— | —F— | —T— | —E— | —T— | —F— | —F— | —T— |
| CHEMRCTA | 1000 | 1000 | —T— | —F— | —F— | —F— | —T— | —T— | —T— | —T— | —T— | 717 | 5070 | 1146 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTA | 5000 | 5000 | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —F— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CHEMRCTB | 10 | 10 | 1 | 1 | 1 | 1 | 1 | —F— | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CHEMRCTB | 50 | 50 | 3 | 5 | 4 | —F— | —F— | —F— | —F— | 569 | 3 | 4 | 5 | 4 | 11 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 |

Cputimes (in seconds) ( 3 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMRCTB | 100 | 100 | 4 | 4 | 10 | 14 | —F— | —F— | —F— | —S— | 4 | 10 | 10 | 10 | —F— | 4 | 5 | 4 | 5 | 6 | 5 | 5 | 5 |
| CHEMRCTB | 500 | 500 | 47 | 46 | 133 | —F— | —T— | —T— | —T— | —T— | 63 | 128 | 132 | 129 | —F— | 47 | 58 | 66 | 53 | 51 | 50 | 51 | 51 |
| CHEMRCTB | 1000 | 1000 | 156 | —S— | 706 | —F— | —T— | —T— | —T— | —T— | 211 | 454 | 513 | 458 | —F— | 155 | 215 | 219 | —S— | —S— | —S— | —S— | —S— |
| CHNROSNB | 10 | 0 | 3 | 2 | 4 | 3 | 4 | 6 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 2 | 3 | 3 | 3 | 2 | 2 |
| CHNROSNB | 25 | 0 | 4 | 3 | 7 | 5 | 6 | 82 | 6 | 4 | 5 | 6 | 6 | 7 | 6 | 4 | 5 | 3 | 6 | 6 | 4 | 4 | 5 |
| CHNROSNB | 50 | 0 | 9 | 6 | 13 | 9 | 12 | 15 | 10 | 8 | 10 | 11 | 12 | 11 | 13 | 9 | 8 | 9 | 11 | 11 | 8 | 9 | 8 |
| CLIFF | 2 | 0 | 2 | 1 | 3 | 2 | 3 | —I— | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | 2 | 2 | 2 | 2 | 1 |
| CLPLATEA | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CLPLATEA | 49 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CLPLATEA | 100 | 0 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| CLPLATEA | 529 | 0 | 14 | 17 | 8 | 8 | 16 | 18 | 15 | 12 | 18 | 8 | 8 | 8 | 7 | 15 | 17 | 13 | 14 | 14 | 14 | 14 | 16 |
| CLPLATEA | 1024 | 0 | 37 | 43 | 20 | 19 | 40 | 50 | 30 | 30 | 47 | 19 | 20 | 19 | 18 | 38 | 43 | 43 | 38 | 37 | 37 | 37 | 38 |
| CLPLATEA | 5041 | 0 | 372 | 406 | 308 | 143 | 592 | 496 | 366 | 299 | 471 | 301 | 326 | 304 | 201 | 399 | 562 | 516 | 376 | 372 | 371 | 371 | 380 |
| CLPLATEB | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CLPLATEB | 49 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CLPLATEB | 100 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CLPLATEB | 529 | 0 | 9 | 14 | 3 | 3 | 9 | 9 | 9 | 8 | 12 | 3 | 4 | 4 | 4 | 10 | 12 | 9 | 10 | 9 | 10 | 9 | 9 |
| CLPLATEB | 1024 | 0 | 25 | 31 | 6 | 7 | 24 | 25 | 24 | 20 | 31 | 7 | 7 | 7 | 9 | 25 | 29 | 25 | 25 | 25 | 25 | 25 | 25 |
| CLPLATEB | 5041 | 0 | 238 | 395 | 44 | 48 | 252 | 251 | 272 | 191 | 299 | 47 | 51 | 48 | 56 | 259 | 310 | 240 | 242 | 239 | 238 | 238 | 254 |
| CLPLATEC | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CLPLATEC | 49 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| CLPLATEC | 100 | 0 | 4 | 4 | 0 | 0 | 2 | 3 | 3 | 3 | 0 | 0 | 1 | 0 | 1 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 |
| CLPLATEC | 529 | 0 | 79 | 74 | 2 | 2 | 53 | 70 | 74 | 63 | 99 | 2 | 2 | 2 | 8 | 79 | 82 | 79 | 80 | 79 | 79 | 79 | 80 |
| CLPLATEC | 1024 | 0 | 265 | 267 | 4 | 4 | 207 | 368 | 197 | 211 | 334 | 4 | 4 | 4 | 24 | 272 | 273 | 265 | 269 | 265 | 264 | 265 | 275 |
| CLPLATEC | 5041 | 0 | 4931 | 4729 | 24 | 26 | 4311 | 11571 | 3647 | 4039 | 5908 | 26 | 28 | 27 | 546 | 4295 | 8304 | 4987 | 4974 | 5024 | 4828 | 4913 | 5430 |
| CLUSTER | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 3 |
| CORKSCRW | 96 | 70 | 17 | 18 | 57 | 21 | 9 | 13 | 12 | 14 | 15 | 11 | 17 | 11 | 16 | 18 | 15 | 25 | 19 | 132 | 17 | 25 | 23 |
| CORKSCRW | 456 | 350 | 5162 | 1838 | —I— | 204 | —T— | 5001 | 3234 | 3849 | 1716 | 587 | 410 | 260 | 740 | 4781 | 5268 | 5060 | 6385 | —I— | 5263 | 5475 | 5427 |
| CORKSCRW | 906 | 700 | —T— | 17025 | —I— | —I— | —T— | —I— | —T— | —T— | —S— | 1691 | —S— | 1292 | 3190 | —T— | —T— | —T— | —T— | —I— | —T— | —T— | —T— |
| CORKSCRW | 4506 | 3500 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CORKSCRW | 9006 | 7000 | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| CRAGGLVY | 4 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 |
| CRAGGLVY | 10 | 0 | 1 | 1 | 1 | 1 | 2 | 6 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| CRAGGLVY | 50 | 0 | 2 | 2 | 2 | 2 | 2 | 8 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 |
| CRAGGLVY | 100 | 0 | 3 | 2 | 3 | 3 | 4 | 12 | 4 | 3 | 3 | 4 | 4 | 3 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 5 |
| CRAGGLVY | 500 | 0 | 10 | 10 | 9 | 10 | 17 | 37 | 13 | 8 | 12 | 13 | 12 | 12 | 13 | 10 | 10 | 10 | 10 | 11 | 10 | 10 | 15 |
| CRAGGLVY | 1000 | 0 | 18 | 20 | 18 | 19 | 32 | 59 | 25 | 15 | 24 | 22 | 23 | 22 | 22 | 19 | 19 | 20 | 20 | 20 | 19 | 19 | 33 |
| CRAGGLVY | 5000 | 0 | 90 | 96 | 90 | 92 | 160 | 249 | 117 | 75 | 118 | 110 | 110 | 110 | 104 | 92 | 100 | 98 | 95 | 94 | 94 | 94 | —S— |
| CUBE | 2 | 0 | 3 | 3 | 2 | 3 | 4 | 44 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 |
| DALLASL | 906 | 667 | 9353 | —T— | 700 | 333 | 14818 | —I— | 8625 | 11659 | 6014 | 387 | 92 | 89 | 2596 | 6672 | 7504 | 8901 | 9627 | —I— | 9243 | 10796 | ( 9619) |
| DALLASM | 196 | 151 | 437 | —I— | 17 | 26 | 3122 | —I— | 2645 | 1336 | 324 | 43 | 19 | 18 | 241 | 416 | 444 | 401 | 440 | —I— | 443 | 455 | 401 |
| DALLASS | 46 | 31 | 36 | —S— | 7 | 6 | 43 | —I— | 43 | 52 | 60 | 18 | 7 | 7 | 15 | 37 | 33 | 36 | 38 | —I— | 38 | 41 | 45 |
| DEGENLPA | 20 | 15 | 4 | 2 | —I— | 2 | 16 | —I— | 4 | 5 | 3 | 6 | 4 | 3 | 6 | —S— | 3 | —S— | 4 | —S— | 4 | 4 | 3 |
| DEGENLPB | 20 | 15 | —S— | —S— | —I— | 2 | 22 | —I— | —S— | 5 | —S— | 5 | —S— | 3 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| DENSCHNA | 2 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 |
| DENSCHNB | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DENSCHNC | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| DENSCHND | 3 | 0 | 3 | 2 | 4 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 4 | 4 | 5 | 3 | 2 | 2 | 4 | —I— | 3 | 3 | 4 |
| DENSCHNE | 3 | 0 | 1 | —E— | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| DENSCHNF | 2 | 0 | 1 | 0 | 1 | 0 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| DIPIGRI | 7 | 4 | 7 | 4 | 4 | 2 | 3 | 49 | 4 | 5 | 3 | 5 | 4 | 4 | 5 | 6 | 18 | 3 | 6 | —I— | 4 | 7 | —I— |
| DISC2 | 29 | 23 | 13 | 11 | —I— | 19 | 14 | 36 | 10 | 16 | 26 | 16 | 14 | 13 | 23 | 14 | 11 | 23 | 18 | —I— | 12 | 13 | 17 |
| DISCS | 36 | 66 | 778 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —F— | ( 99) | —I— | ( 144) | —F— | —I— | —T— | 306 | 214 | 775 | 769 | —I— |
| DIXCHLNG | 10 | 5 | 4 | 4 | 3 | 2 | 4 | 70 | 4 | ( 8) | 3 | 5 | 5 | 4 | 4 | 5 | 3 | 3 | 9 | —I— | 4 | 4 | ( 106) |
| DIXCHLNV | 10 | 5 | 2 | 4 | 1 | 1 | 3 | 69 | 2 | 2 | 1 | 2 | 2 | 2 | 4 | 5 | 2 | 1 | 3 | —I— | 6 | 3 | 3 |
| DIXMAANA | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 3 |
| DIXMAANA | 90 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 1 | 1 |
| DIXMAANA | 300 | 0 | 2 | 2 | 2 | 6 | 1 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 9 | 4 | 1 | 5 | 3 | 1 |
| DIXMAANA | 1500 | 0 | 10 | 10 | 7 | 274 | 6 | 8 | 8 | 8 | 13 | 8 | 7 | 9 | 9 | 10 | 11 | 191 | 22 | 4 | 21 | 13 | 5 |

Cputimes (in seconds) ( 4 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXMAANA | 3000 | 0 | 20 | 19 | 14 | 1967 | 11 | 15 | 16 | 16 | 27 | 16 | 14 | 15 | 17 | 20 | 23 | 897 | 45 | 8 | 42 | 26 | 9 |
| DIXMAANB | 15 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 3 |
| DIXMAANB | 90 | 0 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 4 | 2 | 0 | 3 | 1 | 5 |
| DIXMAANB | 300 | 0 | 3 | 3 | 2 | 13 | 2 | 3 | 2 | 2 | 4 | 4 | 3 | 4 | 3 | 3 | 3 | 35 | 4 | 1 | 7 | 4 | 9 |
| DIXMAANB | 1500 | 0 | 12 | 12 | 11 | 561 | 9 | 12 | 9 | 11 | 17 | 12 | 13 | 18 | 13 | 13 | 14 | 768 | 19 | 5 | 30 | 16 | 38 |
| DIXMAANB | 3000 | 0 | 25 | 24 | 19 | 4938 | 18 | 24 | 19 | 21 | 33 | 23 | 26 | 32 | 25 | 26 | 42 | 3133 | 37 | 9 | 60 | 32 | 74 |
| DIXMAANC | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 2 | 1 | 3 |
| DIXMAANC | 90 | 0 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 5 | 2 | 0 | 5 | 2 | 3 |
| DIXMAANC | 300 | 0 | 4 | 4 | 3 | 33 | 2 | 3 | 2 | 3 | 5 | 3 | 4 | 4 | 4 | 4 | 5 | 41 | 5 | 1 | 12 | 4 | 7 |
| DIXMAANC | 1500 | 0 | 26 | 26 | 14 | 2548 | 10 | 14 | 11 | 22 | 35 | 23 | 18 | 22 | 21 | 22 | 17 | 1399 | 24 | 5 | 48 | 18 | 28 |
| DIXMAANC | 3000 | 0 | 45 | 46 | 51 | 14802 | 21 | 29 | 22 | 38 | 75 | 44 | 36 | 37 | 41 | 45 | 43 | 5766 | 48 | 9 | 110 | 37 | 54 |
| DIXMAAND | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 3 |
| DIXMAAND | 90 | 0 | 2 | 3 | 1 | 4 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 8 | 3 | 0 | 6 | 2 | 6 |
| DIXMAAND | 300 | 0 | 4 | 8 | 3 | 34 | 3 | 4 | 3 | 3 | 5 | 4 | 5 | 5 | 8 | 4 | 5 | 68 | 8 | 1 | 15 | 5 | 11 |
| DIXMAAND | 1500 | 0 | 16 | 42 | 16 | 2054 | 12 | 17 | 13 | 13 | 21 | 24 | 25 | 25 | 24 | 17 | 22 | 1442 | 48 | 4 | 77 | 23 | 43 |
| DIXMAAND | 3000 | 0 | 37 | 51 | 32 | 9565 | 24 | 35 | 26 | 31 | 49 | 32 | 57 | 47 | 78 | 41 | 44 | 5758 | 105 | 9 | 147 | 42 | 84 |
| DIXMAANE | 15 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 3 |
| DIXMAANE | 90 | 0 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 6 | 2 | 0 | 10 | 2 | 8 |
| DIXMAANE | 300 | 0 | 3 | 5 | 2 | 19 | 6 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 41 | 17 | 1 | 36 | 5 | 41 |
| DIXMAANE | 1500 | 0 | 12 | 23 | 10 | 1097 | 46 | 18 | 9 | 10 | 16 | 9 | 9 | 9 | 9 | 11 | 21 | 848 | 62 | 5 | 192 | 34 | 349 |
| DIXMAANE | 3000 | 0 | 23 | 44 | 21 | 4831 | 115 | 36 | 18 | 19 | 31 | 19 | 19 | 18 | 20 | 23 | 50 | 3353 | 171 | 11 | 402 | 60 | 981 |
| DIXMAANF | 15 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 3 |
| DIXMAANF | 90 | 0 | 2 | 4 | 2 | 4 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 7 | 3 | 0 | 42 | 3 | 7 |
| DIXMAANF | 300 | 0 | 7 | 7 | 7 | 32 | 8 | 4 | 4 | 6 | 8 | 5 | 8 | 5 | 7 | 4 | 6 | 70 | 9 | 1 | 253 | 7 | 39 |
| DIXMAANF | 1500 | 0 | 38 | 42 | 31 | 2409 | 55 | 35 | 23 | 33 | 54 | 37 | 45 | 30 | 65 | 58 | 68 | 1559 | 56 | 5 | 1598 | 45 | 473 |
| DIXMAANF | 3000 | 0 | 80 | 313 | 50 | 9719 | 129 | 62 | 55 | 66 | 108 | 94 | 92 | 110 | 41 | 137 | 72 | 6215 | 118 | 11 | 164 | 66 | 1547 |
| DIXMAANG | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | 1 | 4 |
| DIXMAANG | 90 | 0 | 2 | 5 | 2 | 5 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 9 | 4 | 0 | 19 | 3 | 12 |
| DIXMAANG | 300 | 0 | 8 | 17 | 10 | 44 | 8 | 5 | 4 | 7 | 10 | 5 | 12 | 6 | 16 | 6 | 12 | 77 | 9 | 1 | 258 | 10 | 65 |
| DIXMAANG | 1500 | 0 | 34 | 171 | 44 | 2540 | 52 | 25 | 21 | 28 | 44 | 57 | 58 | 49 | 74 | 41 | 39 | 1629 | 59 | 5 | 1694 | 44 | 876 |
| DIXMAANG | 3000 | 0 | 167 | 551 | 75 | 13236 | 152 | 52 | 44 | 122 | 200 | 106 | 97 | 124 | 104 | 163 | 83 | 6605 | 117 | 11 | —I— | 140 | 2912 |
| DIXMAANH | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 5 | 1 | 5 |
| DIXMAANH | 90 | 0 | 3 | 4 | 2 | 4 | 2 | 2 | 2 | 3 | 3 | 2 | 3 | 3 | 4 | 2 | 3 | 10 | 5 | 0 | 27 | 3 | 23 |
| DIXMAANH | 300 | 0 | 8 | 11 | 7 | 42 | 10 | 6 | 4 | 7 | 10 | 9 | 10 | 10 | 13 | 10 | 7 | 81 | 15 | 1 | —I— | 8 | 108 |
| DIXMAANH | 1500 | 0 | 58 | 150 | 41 | 1891 | 64 | 30 | 23 | 49 | 77 | 54 | 55 | 37 | 66 | 46 | 35 | 1824 | 66 | 5 | —I— | 52 | 1466 |
| DIXMAANH | 3000 | 0 | 117 | 546 | 136 | —T— | 160 | 78 | 45 | 99 | 155 | 113 | 170 | 112 | 183 | 98 | 175 | 7489 | 405 | 11 | —I— | 142 | —I— |
| DIXMAANI | 15 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 4 | 1 | 3 |
| DIXMAANI | 90 | 0 | 1 | 2 | 1 | 3 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 3 | 0 | 17 | 2 | —I— |
| DIXMAANI | 300 | 0 | 2 | 5 | 4 | 21 | 36 | 4 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 5 | 52 | 10 | 1 | 67 | 5 | —I— |
| DIXMAANI | 1500 | 0 | 14 | 28 | 18 | 1225 | 546 | 24 | 9 | 12 | 19 | 9 | 8 | 10 | 14 | 14 | 32 | 1086 | 76 | 5 | 623 | 26 | 8 |
| DIXMAANI | 3000 | 0 | 31 | 63 | 46 | 5695 | 2046 | 54 | 18 | 26 | 41 | 18 | 19 | 20 | 37 | 31 | 37 | 4306 | 348 | 10 | 1443 | 62 | 12 |
| DIXMAANJ | 15 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 28 | 1 | 4 |
| DIXMAANJ | 90 | 0 | 3 | 0 | 3 | 4 | 5 | 2 | 1 | 2 | 3 | 2 | 3 | 4 | 4 | 3 | 5 | 10 | 5 | 0 | 65 | 3 | 203 |
| DIXMAANJ | 300 | 0 | 10 | 0 | 9 | 37 | 33 | 9 | 5 | 6 | 9 | 12 | 14 | 9 | 15 | 10 | 6 | 76 | 13 | 1 | 65 | 16 | —I— |
| DIXMAANJ | 1500 | 0 | 57 | 1 | 434 | 2462 | 689 | 45 | 35 | 41 | 72 | 90 | 71 | 73 | 79 | 54 | 49 | 1884 | 56 | 6 | 328 | 76 | 6 |
| DIXMAANJ | 3000 | 0 | 131 | 2 | 2010 | —T— | 1876 | 90 | 43 | 100 | 168 | 225 | 180 | 148 | 116 | 100 | 158 | 7960 | 155 | 11 | 247 | 139 | 12 |
| DIXMAANK | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 0 | 10 | 1 | 7 |
| DIXMAANK | 90 | 0 | 3 | 20 | 7 | 4 | 4 | 4 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 12 | 6 | 0 | 40 | 4 | —I— |
| DIXMAANK | 300 | 0 | 8 | 34 | 13 | 51 | 29 | 9 | 4 | 7 | 11 | 13 | 17 | 11 | 14 | 12 | 9 | 112 | 13 | 1 | 111 | 12 | —I— |
| DIXMAANK | 1500 | 0 | 57 | 396 | 108 | 3829 | 428 | 45 | 29 | 52 | 75 | 80 | 93 | 105 | 114 | 50 | 71 | 2389 | 71 | 5 | 263 | 75 | 6 |
| DIXMAANK | 3000 | 0 | 100 | 707 | 473 | —T— | 1412 | 97 | 62 | 82 | 135 | 169 | 108 | 181 | 444 | 128 | 273 | 8886 | 149 | 11 | 381 | 152 | 12 |
| DIXMAANL | 15 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 0 | 9 | 1 | 7 |
| DIXMAANL | 90 | 0 | 6 | 8 | 5 | 5 | 5 | 3 | 2 | 5 | 7 | 4 | 5 | 4 | 3 | 3 | 5 | 14 | 12 | —I— | 78 | 3 | —I— |
| DIXMAANL | 300 | 0 | 9 | 33 | 24 | 55 | 47 | 12 | 5 | 8 | 12 | 14 | 19 | 18 | 13 | 15 | 14 | 114 | 14 | —E— | 460 | 14 | —I— |
| DIXMAANL | 1500 | 0 | 71 | 321 | 230 | 4446 | 319 | 51 | 31 | 53 | 95 | 107 | 69 | 111 | 217 | 92 | 79 | 2472 | 82 | —T— | 280 | 87 | 6 |
| DIXMAANL | 3000 | 0 | 153 | 468 | 639 | —T— | 1412 | 97 | 53 | 136 | 204 | 209 | 292 | 228 | 785 | 217 | 360 | 12471 | 218 | —T— | 472 | 167 | 12 |
| DIXON3DQ | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DIXON3DQ | 50 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DIXON3DQ | 100 | 0 | 0 | 0 | 1 | 1 | 2 | 3 | 3 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |

Cputimes (in seconds) ( 5 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DIXON3DQ | 500 | 0 | 1 | 1 | 1 | 1 | 27 | 48 | 32 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| DIXON3DQ | 1000 | 0 | 2 | 2 | 3 | 3 | 101 | 193 | 164 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DIXON3DQ | 5000 | 0 | 10 | 10 | 12 | 12 | 2723 | 4644 | 2739 | 8 | 14 | 12 | 12 | 13 | 15 | 12 | 25 | 11 | 10 | 10 | 10 | 10 | 10 |
| DQDRTIC | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 100 | 0 | 0 | 1 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| DQDRTIC | 500 | 0 | 1 | 2 | 1 | 1 | 1 | 10 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| DQDRTIC | 1000 | 0 | 2 | 4 | 2 | 2 | 2 | 18 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 4 | 5 | 2 | 2 | 2 | 2 | 2 | 2 |
| DQDRTIC | 5000 | 0 | 10 | 17 | 9 | 10 | 9 | 81 | 10 | 12 | 10 | 10 | 10 | 10 | 10 | 20 | 30 | 11 | 10 | 10 | 10 | 10 | 10 |
| DQRTIC | 10 | 0 | 2 | 1 | 2 | 2 | 2 | 11 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| DQRTIC | 50 | 0 | 3 | 2 | 3 | 3 | 3 | —I— | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| DQRTIC | 100 | 0 | 4 | 4 | 4 | 4 | 4 | —I— | 4 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 |
| DQRTIC | 500 | 0 | 14 | 19 | 12 | 11 | 14 | —I— | 10 | 11 | 19 | 14 | 14 | 14 | 12 | 12 | 13 | 14 | 14 | 14 | 14 | 14 | 13 |
| DQRTIC | 1000 | 0 | 26 | 58 | 21 | 21 | 30 | —I— | 20 | 22 | 37 | 27 | 27 | 27 | 22 | 24 | 26 | 27 | 27 | 27 | 27 | 27 | 26 |
| DQRTIC | 5000 | 0 | 151 | 1141 | 111 | 115 | 214 | —I— | 113 | 118 | 209 | 148 | 149 | 147 | 128 | 129 | 156 | 157 | 148 | 151 | 152 | 150 | 151 |
| EDENSCH | 36 | 0 | 2 | 1 | 2 | 2 | 2 | 11 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 5 | —I— | 2 | 2 | 2 |
| EDENSCH | 2000 | 0 | 31 | 30 | 34 | 34 | 32 | 173 | 30 | 27 | 40 | 43 | 43 | 42 | 36 | 32 | 45 | 35 | 129 | —I— | 40 | 34 | 37 |
| ENGVAL1 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| ENGVAL1 | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| ENGVAL1 | 100 | 0 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 5 | 2 | 2 | 2 |
| ENGVAL1 | 1000 | 0 | 9 | 13 | 10 | 10 | 8 | 13 | 9 | 8 | 12 | 11 | 11 | 11 | 10 | 9 | 12 | 9 | 10 | 31 | 10 | 9 | 10 |
| ENGVAL1 | 5000 | 0 | 44 | 65 | 47 | 50 | 35 | 60 | 44 | 35 | 56 | 54 | 53 | 52 | 46 | 45 | 59 | 46 | 46 | —S— | 46 | 45 | 51 |
| ENGVAL2 | 3 | 0 | 2 | 1 | 2 | 1 | 2 | 6 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| ERRINBAR | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| ERRINROS | 10 | 0 | 5 | —S— | 4 | 3 | 7 | ( 6) | 6 | 5 | 5 | 5 | 6 | 5 | 5 | 5 | 3 | 4 | 9 | 9 | 4 | 4 | 4 |
| ERRINROS | 25 | 0 | 5 | 5 | 7 | 4 | 9 | ( 6) | 11 | 5 | 6 | 7 | 7 | 7 | 7 | 6 | 4 | 6 | 11 | 10 | 5 | 5 | 7 |
| ERRINROS | 50 | 0 | 9 | 6 | 9 | 5 | 13 | ( 13) | 12 | 8 | 10 | 10 | 10 | 9 | 7 | 9 | 6 | 8 | 13 | 12 | 6 | 6 | 15 |
| EXPFIT | 2 | 0 | 1 | 1 | —E— | —E— | 1 | —E— | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | —I— | 1 | 1 | 1 |
| EXPFITA | 5 | 22 | 4 | 5 | —I— | 2 | 7 | 59 | 4 | 5 | 5 | 5 | 2 | 3 | 4 | 4 | 4 | 3 | 10 | —I— | 14 | 14 | 16 |
| EXPFITB | 5 | 102 | 45 | 34 | —I— | 9 | 46 | 255 | 30 | 37 | 51 | 23 | 12 | 48 | 22 | 40 | 115 | 41 | 71 | —I— | 121 | 55 | 104 |
| EXPFITC | 5 | 502 | 384 | —S— | —T— | 94 | 536 | —I— | 302 | 314 | 434 | 1655 | 116 | 5983 | 262 | 315 | 1119 | 384 | 556 | —I— | 978 | 467 | —I— |
| EXTROSNB | 5 | 0 | 5 | 3 | 6 | 4 | 7 | 19 | 8 | 5 | 5 | 6 | 7 | 6 | 6 | 5 | 4 | 3 | 6 | 5 | 5 | 5 | 4 |
| EXTROSNB | 10 | 0 | 43 | 25 | 30 | 27 | 39 | —I— | 59 | 44 | 44 | 48 | 53 | 48 | 48 | 43 | 27 | 26 | 52 | 49 | 43 | 41 | 35 |
| FREUROTH | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| FREUROTH | 10 | 0 | 1 | 0 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 |
| FREUROTH | 50 | 0 | 1 | 1 | 1 | 1 | 2 | 7 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | 5 | 2 | 2 | —I— |
| FREUROTH | 100 | 0 | 2 | 1 | 2 | 2 | 2 | 9 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 4 | 9 | 2 | 2 | —I— |
| FREUROTH | 500 | 0 | 7 | 4 | 8 | 8 | 7 | 27 | —S— | 6 | 8 | 9 | 9 | 8 | 8 | 8 | 7 | 8 | —S— | —S— | 7 | 7 | 18 |
| FREUROTH | 1000 | 0 | 13 | 8 | 16 | 20 | —S— | 50 | —S— | 11 | 16 | 15 | 17 | 15 | 15 | 14 | 15 | 16 | 43 | —S— | 14 | 14 | —S— |
| FREUROTH | 5000 | 0 | 70 | 40 | 77 | 97 | 58 | 236 | —S— | 57 | 77 | 74 | 81 | 73 | 73 | 77 | —S— | 79 | —S— | —S— | 66 | 66 | —S— |
| GAUSSELM | 14 | 11 | 3 | —E— | 6 | ( 1) | ( 1) | ( 1) | ( 3) | ( 2) | ( 3) | 4 | 3 | ( 2) | 4 | 4 | 4 | 3 | 8 | —I— | 3 | 3 | 5 |
| GAUSSELM | 506 | 1135 | —T— | —E— | —I— | ( 3207) | ( 192) | —I— | 6833 | ( 10991) | —T— | —I— | ( 2890) | ( 1489) | ( 2908) | ( 17432) | ( 13794) | —T— | —I— | —I— | ( 15027) | ( 10998) | ( 8879) |
| GAUSSELM | 650 | 1496 | —T— | —E— | —I— | ( 2164) | ( 305) | —I— | —T— | 7204 | ( 11825) | —I— | ( 2962) | ( 3215) | ( 5423) | ( 17779) | —T— | —T— | —I— | —I— | —T— | —T— | ( 10237) |
| GOTTFR | 2 | 0 | 2 | 1 | 1 | 1 | 1 | 32 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| GRIDNETA | 60 | 36 | 5 | 9 | 2 | 1 | 4 | 9 | 5 | 6 | 2 | 2 | 2 | 2 | 4 | 5 | 5 | 4 | 6 | 98 | 5 | 6 | 6 |
| GRIDNETA | 180 | 100 | 21 | 46 | 4 | 4 | 15 | 28 | 18 | 21 | 31 | 5 | 5 | 4 | 14 | 21 | 20 | 20 | 24 | 224 | 21 | 21 | 24 |
| GRIDNETA | 612 | 324 | 105 | 327 | 12 | 15 | 109 | 147 | 102 | 124 | 138 | 13 | 14 | 13 | 77 | 104 | 116 | 112 | 119 | 1018 | 109 | 107 | 127 |
| GRIDNETA | 924 | 484 | 322 | 1051 | 25 | 27 | 330 | 393 | 289 | 383 | 423 | 27 | 28 | 27 | 209 | 334 | 333 | 335 | 384 | 2048 | 331 | 331 | 382 |
| GRIDNETA | 3444 | 1764 | 1739 | 5448 | —I— | 113 | 1869 | 2003 | 1653 | 2104 | 2394 | 116 | 123 | 118 | 1131 | 1737 | 1939 | 1955 | 1869 | 9411 | 1806 | 1802 | 2002 |
| GRIDNETA | 7564 | 3844 | 17428 | —T— | —I— | 412 | —T— | —T— | —T— | —T— | —T— | 330 | 342 | 330 | —T— | 17397 | —T— | —T— | 17870 | —T— | —T— | 17674 | —T— |
| GRIDNETA | 13284 | 6724 | —T— | —T— | —I— | 963 | —T— | —T— | —T— | —T— | —T— | 994 | 1027 | 991 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETB | 60 | 36 | 5 | 5 | 2 | 1 | 3 | 7 | 4 | 6 | 10 | 2 | 2 | 2 | 4 | 6 | 5 | 5 | 6 | —I— | 5 | 6 | 5 |
| GRIDNETB | 180 | 100 | 18 | 17 | 4 | 4 | 14 | 25 | 15 | 22 | 26 | 5 | 5 | 4 | 27 | 18 | 19 | 18 | 19 | —I— | 18 | 19 | 18 |
| GRIDNETB | 612 | 324 | 105 | 105 | 15 | 18 | 95 | 154 | 101 | 119 | 141 | 16 | 17 | 16 | 146 | 104 | 105 | 106 | 109 | —I— | 104 | 110 | 115 |
| GRIDNETB | 924 | 484 | 221 | 220 | 27 | 35 | 216 | 316 | 214 | 251 | 296 | 28 | 31 | 28 | 322 | 227 | 227 | 230 | 225 | —I— | 229 | 225 | 231 |
| GRIDNETB | 3444 | 1764 | 1858 | 1867 | 142 | 166 | 1821 | 2188 | 1523 | 1894 | 2488 | 149 | 163 | 149 | 2120 | 1866 | 1895 | 1931 | 1847 | —I— | 1844 | 1868 | 1824 |
| GRIDNETB | 7564 | 3844 | 6446 | 6541 | 442 | 499 | 6015 | 6576 | 4884 | 6177 | 8842 | 457 | 504 | 458 | 7235 | 6237 | 6900 | 6470 | 6517 | —I— | 6583 | 6415 | 6657 |
| GRIDNETB | 13284 | 6724 | 14958 | 15402 | 1006 | 1136 | 13173 | 15491 | 10668 | 12975 | —T— | 1120 | 1139 | 1035 | 16374 | 14605 | 15759 | 14731 | 14697 | —I— | 14832 | 15025 | 14925 |
| GRIDNETC | 60 | 36 | 6 | 14 | 58 | 1 | 5 | 7 | 5 | 6 | 8 | 2 | 2 | 2 | 4 | 6 | 7 | 6 | 7 | —I— | 7 | 6 | 6 |

Cputimes (in seconds) ( 6 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GRIDNETC | 180 | 100 | 26 | 58 | 145 | 4 | 21 | 31 | 21 | 25 | 40 | 6 | 5 | 5 | 29 | 29 | 28 | 26 | 30 | —I— | 29 | 29 | 27 |
| GRIDNETC | 612 | 324 | 218 | 525 | —I— | 35 | 172 | 221 | 202 | 191 | 307 | 54 | 47 | 45 | 218 | 217 | 242 | 225 | 229 | —I— | 207 | 226 | 222 |
| GRIDNETC | 924 | 484 | 433 | 1051 | —I— | 70 | 329 | 417 | 328 | 361 | 612 | 94 | 83 | 82 | 425 | 437 | 445 | 460 | 433 | —I— | 429 | 415 | 443 |
| GRIDNETC | 3444 | 1764 | 6219 | 14477 | —I— | 1058 | 3894 | 4788 | 4228 | 4820 | 9006 | 1323 | 1291 | 1265 | 5169 | 6211 | 8342 | 5786 | 6318 | —I— | 5926 | 6211 | 6528 |
| GRIDNETC | 7564 | 3844 | —T— | —T— | —I— | 5708 | —T— | —T— | —T— | —T— | —T— | 6866 | 6930 | 6845 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETD | 60 | 36 | 6 | 13 | 2 | 1 | 5 | 11 | 7 | 7 | 2 | 2 | 2 | 2 | 4 | 7 | 6 | 6 | 7 | 83 | 6 | 7 | 23 |
| GRIDNETD | 180 | 100 | 27 | 69 | 5 | 5 | 24 | 38 | 25 | 29 | 37 | 6 | 5 | 5 | 16 | 26 | 25 | 26 | 28 | 187 | 29 | 27 | 85 |
| GRIDNETD | 612 | 324 | 139 | 524 | 16 | 17 | 156 | 218 | 144 | 172 | 172 | 19 | 18 | 17 | 110 | 137 | 148 | 145 | 146 | 914 | 140 | 182 | 439 |
| GRIDNETD | 924 | 484 | 426 | 1898 | 60 | 41 | 521 | 633 | 459 | 521 | 529 | 41 | 41 | 39 | 340 | 429 | 442 | 425 | 439 | 2261 | 443 | 539 | 1485 |
| GRIDNETD | 3444 | 1764 | 2726 | 11123 | —I— | 175 | 2962 | 3300 | 2495 | 3066 | 3505 | 200 | 189 | 180 | 1743 | 2488 | 2615 | —S— | 2682 | 11205 | 2533 | 3120 | 7049 |
| GRIDNETD | 7564 | 3844 | —T— | —T— | —T— | 1121 | —T— | —T— | —T— | —T— | —T— | 1078 | 1091 | 1027 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETE | 60 | 36 | 7 | 6 | 2 | 2 | 4 | 9 | 5 | 7 | 11 | 2 | 2 | 2 | 6 | 7 | 6 | 6 | 7 | —I— | 7 | 7 | 76 |
| GRIDNETE | 180 | 100 | 22 | 21 | 5 | 5 | 23 | 39 | 23 | 29 | 31 | 5 | 6 | 6 | 33 | 22 | 22 | 24 | 23 | —I— | 22 | 29 | —I— |
| GRIDNETE | 612 | 324 | 126 | 126 | 19 | 24 | 150 | 240 | 145 | 166 | 159 | 20 | 22 | 21 | 202 | 124 | 127 | 130 | 136 | —I— | 130 | 157 | —I— |
| GRIDNETE | 924 | 484 | 256 | 256 | 35 | 43 | 324 | 482 | 305 | 338 | 323 | 37 | 40 | 37 | 379 | 259 | 267 | 264 | 260 | —I— | 260 | 383 | —I— |
| GRIDNETE | 3444 | 1764 | 2120 | 2139 | 245 | 282 | 2509 | 3123 | 2076 | 2520 | 2677 | 258 | 282 | 260 | 3103 | 2118 | 2319 | 2218 | 2207 | —I— | 2207 | 2826 | —I— |
| GRIDNETE | 7564 | 3844 | 7258 | 7676 | 693 | 784 | 7990 | 9823 | 6561 | 7787 | 9068 | 736 | 800 | 726 | 9541 | 7310 | 7548 | 7353 | 7368 | —I— | 7238 | 7630 | —I— |
| GRIDNETF | 60 | 36 | 7 | 15 | 16 | 2 | 5 | 9 | 7 | 7 | 10 | 2 | 2 | 2 | 5 | 7 | 7 | 7 | 8 | —I— | 7 | 7 | 42 |
| GRIDNETF | 180 | 100 | 33 | 87 | 286 | 6 | 31 | 47 | 32 | 36 | 44 | 8 | 7 | 7 | 37 | 33 | 33 | 33 | 36 | —I— | 33 | 44 | 369 |
| GRIDNETF | 612 | 324 | 217 | 619 | —I— | 37 | 221 | 289 | 238 | 237 | 291 | 47 | 43 | 42 | 231 | 221 | 251 | 236 | 222 | —I— | 221 | 356 | 963 |
| GRIDNETF | 924 | 484 | 474 | 2218 | —I— | 90 | 461 | 615 | 499 | 482 | 634 | 103 | 101 | 98 | 521 | 497 | 529 | 491 | 513 | —I— | 506 | 864 | —I— |
| GRIDNETF | 3444 | 1764 | 6405 | 17226 | —I— | 1184 | 5280 | 6382 | 5440 | 5548 | 8971 | 1441 | 1434 | 1405 | 5346 | 6312 | 7815 | 5888 | 6747 | —I— | 6428 | 11919 | —I— |
| GRIDNETF | 7564 | 3844 | —T— | —T— | —T— | 8249 | —T— | —T— | —T— | —T— | —T— | 10220 | 10378 | 10219 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| GRIDNETG | 60 | 36 | 7 | 7 | 3 | 3 | 6 | 13 | 7 | 8 | 2 | 3 | 3 | 3 | 8 | 6 | 7 | 6 | 7 | 82 | 7 | 7 | 28 |
| GRIDNETH | 60 | 36 | 7 | 7 | 4 | 4 | 5 | 9 | 6 | 8 | 12 | 4 | 5 | 5 | 10 | 8 | 8 | 7 | 8 | —I— | 7 | 7 | 24 |
| GRIDNETI | 60 | 36 | 7 | 6 | 42 | 4 | 6 | 10 | 7 | 8 | 11 | 4 | 4 | 4 | 8 | 8 | 9 | 7 | 8 | 166 | 7 | 8 | 25 |
| GULF | 3 | 0 | 6 | 5 | 5 | 6 | 7 | —E— | 8 | 10 | 6 | 9 | 9 | 7 | 8 | 6 | 6 | 5 | 27 | —I— | 7 | 7 | 9 |
| HAGER1 | 21 | 10 | 1 | 1 | 1 | 1 | 1 | 7 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HAGER1 | 101 | 50 | 2 | 2 | 4 | 2 | 3 | 103 | 12 | 2 | 2 | 3 | 1 | 3 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| HAGER1 | 201 | 100 | 4 | 4 | 20 | 4 | 9 | —I— | 47 | 3 | 4 | 14 | 1 | 17 | 16 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 |
| HAGER1 | 1001 | 500 | 17 | 11 | 1936 | 77 | 292 | —I— | 1776 | 12 | 19 | 643 | 5 | 1881 | 91 | 15 | 16 | 11 | 14 | 15 | 16 | 14 | 14 |
| HAGER1 | 2001 | 1000 | 28 | 33 | 15652 | 367 | 764 | —I— | 7339 | 20 | 35 | 5150 | 10 | 15299 | 145 | 27 | 31 | 23 | 25 | 25 | 27 | 25 | 25 |
| HAGER1 | 10001 | 5000 | 141 | 157 | —M— | —T— | —T— | —T— | —T— | 103 | 172 | 134 | 312 | —M— | 721 | 132 | 239 | 123 | 132 | 127 | 136 | 126 | 127 |
| HAGER2 | 21 | 10 | 1 | 1 | 1 | 1 | 1 | 7 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| HAGER2 | 101 | 50 | 3 | 3 | 4 | 1 | 4 | 120 | 14 | 2 | 3 | 5 | 1 | 3 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 |
| HAGER2 | 201 | 100 | 4 | 5 | 25 | 4 | 9 | —I— | 56 | 3 | 5 | 21 | 2 | 23 | 19 | 4 | 4 | 4 | 4 | 6 | 4 | 4 | 4 |
| HAGER2 | 1001 | 500 | 18 | 30 | 2900 | 48 | 265 | —I— | 2920 | 13 | 20 | 1340 | 9 | 2541 | 105 | 17 | 19 | 14 | 15 | 26 | 15 | 14 | 15 |
| HAGER2 | 2001 | 1000 | 32 | 43 | —T— | 179 | 832 | —I— | 9506 | 24 | 38 | —T— | 17 | —T— | 204 | 31 | 32 | 530 | 32 | 38 | 32 | 31 | 33 |
| HAGER2 | 10001 | 5000 | 151 | —S— | —M— | —I— | —T— | —T— | —T— | 128 | 195 | —E— | 327 | —M— | 748 | 159 | 327 | 13528 | 126 | ( 134) | 132 | 124 | 129 |
| HAGER3 | 21 | 10 | 1 | 1 | 1 | 1 | 1 | 9 | 2 | 1 | 2 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| HAGER3 | 101 | 50 | 3 | 4 | 4 | 1 | 4 | 166 | 18 | 2 | 3 | 8 | 2 | 4 | 2 | 3 | 3 | 2 | 3 | 4 | 3 | 3 | 3 |
| HAGER3 | 201 | 100 | 4 | 6 | 23 | 3 | 12 | —I— | 95 | 4 | 5 | 30 | 2 | 23 | 21 | 5 | 4 | 4 | 6 | 6 | 6 | 5 | 6 |
| HAGER3 | 1001 | 500 | 20 | 30 | 2514 | 16 | 379 | —I— | 3465 | 18 | 25 | 2856 | 10 | 2510 | 135 | 21 | 21 | 15 | 22 | 29 | 20 | 22 | 24 |
| HAGER3 | 2001 | 1000 | 38 | 47 | —T— | 48 | 1334 | —I— | 15179 | 32 | 48 | —T— | 21 | —T— | 284 | 39 | 32 | 32 | 68 | 227 | 44 | 42 | 47 |
| HAGER3 | 10001 | 5000 | 149 | —S— | —M— | —I— | —T— | —T— | —T— | 131 | 177 | —M— | 369 | —M— | 876 | 156 | 299 | 160 | 178 | 1774 | 170 | 158 | 174 |
| HAGER4 | 21 | 10 | 1 | 1 | 1 | 1 | 1 | 29 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 |
| HAGER4 | 101 | 50 | 4 | 5 | 16 | 3 | 9 | —I— | 44 | 3 | 5 | 3 | 2 | 4 | 4 | 5 | 5 | 3 | 5 | 9 | 5 | 5 | 9 |
| HAGER4 | 201 | 100 | 11 | 13 | 136 | 9 | 42 | —I— | 351 | 8 | 15 | 8 | 5 | 19 | 23 | 12 | 14 | 7 | 14 | 18 | 14 | 13 | 25 |
| HAGER4 | 1001 | 500 | 252 | 289 | —T— | 332 | 4914 | —I— | —T— | 165 | 363 | 300 | 127 | 4312 | 1094 | 273 | 295 | 236 | 273 | 435 | 268 | 264 | 369 |
| HAGER4 | 2001 | 1000 | 1062 | 1361 | —T— | 2105 | —T— | —I— | —T— | 696 | 1534 | 6705 | 475 | —T— | 4995 | 1084 | 1284 | 1063 | 1090 | 1904 | 1156 | 1068 | 1841 |
| HAGER4 | 10001 | 5000 | —T— | —T— | —M— | —T— | —T— | —I— | —T— | 12352 | —T— | —T— | 14069 | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| HAIRY | 2 | 0 | 5 | 4 | 2 | 4 | 6 | 6 | 8 | 5 | 5 | 7 | 5 | 6 | 7 | 4 | 3 | 2 | 4 | —S— | 6 | 5 | 8 |
| HATFLDA | 4 | 0 | 2 | 1 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 2 |
| HATFLDB | 4 | 0 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 3 | 2 |
| HATFLDC | 25 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| HATFLDD | 3 | 0 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 2 | 2 | 1 | 1 | 3 | 2 | 2 | 1 | 3 | —I— | 2 | 2 | 2 |
| HATFLDE | 3 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 1 | 1 | 3 | —I— | 3 | 2 | 2 |
| HATFLDF | 3 | 0 | 2 | 4 | 2 | 3 | 6 | 2 | 1 | 2 | 2 | 4 | 4 | 4 | 3 | 2 | 1 | 2 | 2 | —I— | 2 | 1 | 1 |
| HATFLDG | 25 | 0 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | —I— | 2 | 2 | 2 |

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HATFLDH | 4 | 7 | 1 | 1 | 6 | 1 | 1 | 4 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | —I— | 2 | 1 | 1 |
| HELIX | 3 | 0 | 1 | —S— | 1 | 1 | 1 | 6 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | —I— | 2 | 2 | 2 |
| HILBERTA | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTA | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| HILBERTA | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| HILBERTB | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HILBERTB | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| HILBERTB | 50 | 0 | 2 | 3 | 1 | 1 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 5 |
| HIMMELBA | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBB | 2 | 0 | 1 | 0 | 1 | 1 | 2 | 14 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 |
| HIMMELBC | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| HIMMELBD | 2 | 0 | 3 | 2 | 2 | 2 | 3 | —I— | 3 | 3 | 3 | 4 | 4 | 4 | 4 | —S— | 3 | 2 | 3 | —S— | 3 | 3 | 3 |
| HIMMELBE | 3 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBF | 4 | 0 | 23 | 21 | —I— | 19 | 34 | —I— | 39 | 19 | 19 | 36 | 30 | 18 | 13 | 42 | 11 | 10 | 27 | —S— | 9 | 4 | 7 |
| HIMMELBG | 2 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| HIMMELBH | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HIMMELBI | 100 | 12 | 32 | 32 | —I— | 74 | 10 | —I— | 14 | 17 | 45 | 48 | 44 | —E— | 29 | 28 | 235 | 44 | 84 | —E— | 152 | 52 | 59 |
| HIMMELBJ | 45 | 14 | —I— | —I— | 312 | 369 | —I— | 510 | —I— | —I— | —I— | —I— | —S— | 62 | —I— | —I— | —I— | 16435 | —I— | —I— | —I— | —I— | —I— |
| HIMMELBK | 24 | 14 | 42 | ( 3) | —I— | 48 | 35 | —I— | 38 | 39 | ( 5) | 43 | ( 6) | 31 | 30 | 39 | 43 | 43 | 74 | —I— | 57 | 44 | 48 |
| HONG | 4 | 1 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 9 | 3 | 3 | 2 |
| HS1 | 2 | 0 | 3 | 3 | 2 | 2 | 3 | 7 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 2 |
| HS10 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | —I— | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 3 |
| HS100 | 7 | 4 | 5 | 4 | 2 | 2 | 3 | 49 | 4 | 5 | 4 | 5 | 4 | 4 | 5 | 5 | 22 | 3 | 7 | —I— | 5 | 5 | —I— |
| HS100MOD | 7 | 4 | 17 | —S— | 5 | —I— | 12 | —I— | —S— | —S— | —S— | 13 | 10 | 5 | 15 | —S— | —I— | 10 | 18 | —I— | 18 | —S— | —I— |
| HS101 | 7 | 5 | —I— | 17 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS102 | 7 | 5 | —I— | 22 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS103 | 7 | 5 | —I— | —S— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS104 | 8 | 5 | 6 | 4 | 4 | 2 | 6 | 17 | 5 | 8 | 4 | 8 | 4 | 4 | 4 | 6 | 7 | 3 | 12 | —I— | 8 | 7 | 15 |
| HS105 | 8 | 1 | ( 10) | 18 | ( 8) | 12 | 17 | ( 19) | ( 9) | ( 11) | ( 11) | 16 | ( 9) | ( 9) | 13 | ( 9) | ( 11) | ( 13) | —I— | —I— | 514 | ( 79) | —E— |
| HS106 | 8 | 6 | —I— | 5 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS107 | 9 | 6 | 3 | 3 | 3 | 2 | —S— | 41 | 4 | 4 | 2 | 5 | 3 | 3 | 3 | 3 | 5 | 2 | —S— | —I— | 5 | 5 | 9 |
| HS108 | 9 | 13 | 3 | 3 | 6 | 2 | 3 | 4 | 3 | 3 | 5 | 3 | 2 | 3 | 2 | 3 | 3 | 3 | 6 | —I— | 4 | 4 | 7 |
| HS109 | 9 | 10 | —I— | 20 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS11 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 8 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| HS110 | 10 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| HS111 | 10 | 3 | 7 | 6 | 5 | 4 | 8 | 13 | 8 | 8 | 6 | 11 | 6 | 9 | 8 | 7 | 8 | 6 | —I— | —I— | —I— | 22 | —I— |
| HS112 | 10 | 3 | 5 | 4 | 4 | 4 | 6 | 7 | 6 | 5 | 5 | 6 | 6 | 5 | 5 | 5 | 7 | 4 | 7 | —I— | 7 | 7 | 18 |
| HS113 | 10 | 8 | 9 | 5 | 3 | 3 | 6 | 63 | 7 | 10 | 9 | 9 | 5 | 4 | 5 | 9 | 105 | 5 | 9 | —I— | 9 | 10 | —I— |
| HS114 | 10 | 11 | 79 | 12 | —I— | —I— | —I— | —I— | —S— | 75 | 76 | 67 | —S— | 35 | —I— | 83 | —S— | 34 | —I— | —I— | —I— | 89 | —I— |
| HS116 | 13 | 14 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| HS117 | 15 | 5 | 9 | 8 | —I— | —I— | 9 | 58 | 7 | 5 | 11 | 11 | 6 | 7 | 6 | 7 | 17 | 9 | 60 | —I— | 10 | 9 | —I— |
| HS118 | 15 | 17 | 3 | 2 | —I— | 1 | 3 | 29 | 3 | 3 | 3 | 3 | 1 | 1 | 2 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 |
| HS119 | 16 | 8 | 7 | 8 | 7 | 5 | 6 | 25 | 7 | 7 | 5 | 7 | 5 | 5 | 5 | 7 | 9 | 6 | 24 | —I— | 10 | 10 | 39 |
| HS12 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 49 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 7 | 1 | 3 | —I— | 3 | 2 | 3 |
| HS13 | 2 | 1 | 5 | 3 | 5 | 3 | 6 | 6 | 5 | 5 | 5 | 6 | 6 | 6 | 5 | 5 | 5 | 3 | 19 | 19 | 7 | 7 | 6 |
| HS14 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HS15 | 2 | 2 | 4 | 3 | 5 | 3 | 4 | 45 | 4 | 4 | 4 | 5 | 5 | 5 | 4 | 4 | 3 | 3 | 8 | 11 | 4 | 6 | 9 |
| HS16 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 5 | 3 | 2 | 3 |
| HS17 | 2 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | —S— | 3 | 3 | 3 |
| HS18 | 2 | 2 | 7 | 6 | 6 | 4 | 16 | 75 | 13 | 13 | 8 | 17 | 8 | 7 | 7 | 7 | 6 | 5 | 11 | —I— | 9 | 8 | 9 |
| HS19 | 2 | 2 | 3 | —S— | 3 | 2 | 3 | —I— | 3 | 3 | 3 | 4 | 4 | 4 | 3 | 3 | 6 | 2 | 3 | 3 | 3 | 3 | 3 |
| HS2 | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| HS20 | 2 | 3 | 2 | 2 | 3 | 1 | 3 | 5 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 2 |
| HS21 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| HS22 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HS23 | 2 | 5 | 4 | 2 | 5 | 3 | 7 | 26 | 5 | 7 | 4 | 8 | 6 | 5 | 5 | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 3 |
| HS24 | 2 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |

Cputimes (in seconds) ( 8 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS25 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS26 | 3 | 1 | 3 | 3 | 4 | 2 | 3 | 8 | 2 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | —I— | 3 | 2 | 2 |
| HS27 | 3 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 9 | 3 | 2 | 2 |
| HS28 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 |
| HS29 | 3 | 1 | 3 | 2 | 3 | 2 | 2 | 12 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 4 | 2 | 3 | 4 | 3 | 3 | 4 |
| HS3 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS30 | 3 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| HS31 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | —I— | 2 | 2 | 3 |
| HS32 | 3 | 2 | 1 | 1 | 1 | 0 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| HS33 | 3 | 2 | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 3) | ( 1) | ( 2) | ( 1) | ( 2) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | ( 1) | 2 |
| HS34 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| HS35 | 3 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 4 | —I— | 2 | 1 | 5 |
| HS36 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 20 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| HS37 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 45 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 1 | 6 | 29 | 4 | 4 | 10 |
| HS38 | 4 | 0 | 5 | 3 | 4 | 4 | 5 | 17 | 6 | 5 | 5 | 5 | 5 | 6 | 5 | 4 | 2 | 3 | —I— | —I— | 5 | 5 | 2 |
| HS39 | 4 | 2 | 2 | 1 | 1 | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 41 | 41 | 3 | 3 | 2 |
| HS4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS40 | 4 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 2 | 2 | 2 |
| HS41 | 4 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| HS42 | 4 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| HS43 | 4 | 3 | 2 | 2 | 2 | 1 | 3 | 4 | 3 | 3 | 2 | 3 | 2 | 2 | 2 | 2 | 10 | 1 | 41 | —I— | 3 | 3 | 2 |
| HS44 | 4 | 6 | 1 | 1 | ( 1) | ( 3) | 1 | ( 7) | ( 1) | ( 1) | 1 | ( 2) | ( 1) | ( 1) | ( 1) | 1 | 2 | 1 | 3 | —I— | 1 | 1 | 1 |
| HS45 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS46 | 5 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 2 | 4 | 2 | 2 | 3 |
| HS47 | 5 | 3 | ( 2) | 5 | 5 | 5 | ( 3) | ( 2) | ( 2) | ( 3) | ( 2) | ( 3) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 1) | ( 2) | ( 3) | ( 2) | ( 2) | ( 3) |
| HS48 | 5 | 2 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| HS49 | 5 | 2 | 1 | 1 | 1 | 1 | 2 | 6 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 4 | 2 | 2 | 4 |
| HS5 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HS50 | 5 | 3 | 1 | 1 | 1 | 1 | 2 | 21 | 1 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 |
| HS51 | 5 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| HS52 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| HS53 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 |
| HS54 | 6 | 1 | ( 0) | —S— | ( 0) | ( 0) | ( 0) | 3 | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 4) | ( 3) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) |
| HS55 | 6 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| HS56 | 7 | 4 | 2 | 1 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | —I— | —I— | 3 | 3 | 7 |
| HS57 | 2 | 1 | ( 0) | 1 | 1 | —I— | ( 0) | 1 | 2 | ( 1) | ( 0) | 1 | 1 | 1 | 1 | ( 0) | ( 0) | ( 0) | ( 1) | ( 4) | ( 1) | ( 1) | ( 1) |
| HS59 | 2 | 3 | 33 | 5 | ( 23) | ( 15) | 47 | —I— | 37 | 43 | 32 | 44 | 40 | 39 | 34 | 33 | —I— | ( 22) | 43 | —I— | 33 | 34 | 51 |
| HS6 | 2 | 1 | 4 | 3 | 4 | 3 | 5 | 8 | 5 | 5 | 4 | 6 | 5 | 5 | 4 | 4 | 3 | 4 | 5 | 5 | 4 | 4 | 3 |
| HS60 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 1 | 2 | 3 | 2 | 2 | 2 |
| HS61 | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 4 | 2 | 2 | 2 |
| HS62 | 3 | 1 | 3 | 2 | 2 | 2 | 4 | 29 | 3 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | —I— | —I— | 5 | 5 | 9 |
| HS63 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 11 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 5 | 4 | 2 | 2 | 2 |
| HS64 | 3 | 1 | 4 | 3 | 3 | 3 | 6 | 55 | 5 | 5 | 4 | 5 | 5 | 5 | 5 | 4 | 3 | —T— | 5 | 6 | 6 | 6 | 5 |
| HS65 | 3 | 1 | 2 | 2 | 2 | 2 | 4 | 10 | 4 | 6 | 2 | 4 | 3 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 3 | 3 |
| HS66 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| HS67 | 3 | 14 | 6 | 3 | —I— | 6 | 14 | 4 | 4 | 5 | 5 | 5 | 7 | 4 | 5 | 6 | 5 | 6 | —I— | —I— | 21 | 7 | —S— |
| HS68 | 4 | 2 | 8 | —I— | 4 | 4 | 11 | 45 | 9 | 10 | 8 | 11 | 9 | 9 | 8 | 8 | 5 | 5 | —I— | —I— | 12 | 11 | —I— |
| HS69 | 4 | 2 | 3 | 6 | 2 | 2 | 4 | —S— | 4 | —S— | 3 | 4 | 4 | 4 | 3 | 3 | —S— | 2 | —I— | —I— | 8 | —S— | —I— |
| HS7 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | 9 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 3 | 2 | 2 | 2 |
| HS70 | 4 | 1 | 4 | 3 | ( 2) | 2 | 4 | ( 46) | 3 | 4 | 4 | 2 | 3 | 5 | 4 | 3 | 3 | 3 | —I— | —I— | 6 | 6 | 6 |
| HS71 | 4 | 2 | 2 | 1 | 1 | 1 | 2 | 5 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 3 | —I— | 2 | 2 | 4 |
| HS72 | 4 | 2 | 8 | 6 | 5 | 5 | 24 | 9 | 8 | 9 | 8 | 10 | 9 | 9 | 8 | 8 | 6 | —T— | 10 | 10 | 10 | 10 | 10 |
| HS73 | 4 | 3 | 2 | 1 | —I— | 1 | 2 | 42 | 2 | 2 | 1 | 3 | 2 | 3 | 2 | 1 | 7 | 1 | 2 | 2 | 2 | 2 | 2 |
| HS74 | 4 | 5 | 3 | 2 | 1 | 1 | 3 | —I— | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 2 | —S— | 4 | 3 | 3 | 5 |
| HS75 | 4 | 5 | —S— | 2 | —S— | —I— | —I— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS76 | 4 | 3 | 1 | 1 | 1 | 0 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 3 | —I— | 1 | 2 | 2 |
| HS77 | 5 | 2 | 2 | 1 | 2 | 1 | 2 | ( 11) | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 1 | 3 | —I— | 2 | 2 | 2 |
| HS78 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 3 | 2 | 1 | 5 |
| HS79 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 2 | 2 |

Cputimes (in seconds) ( 9 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HS8 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| HS80 | 5 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 4 |
| HS81 | 5 | 3 | 2 | ( 14) | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 74 | 4 | 2 | 2 | 4 |
| HS83 | 5 | 3 | 2 | 1 | 5 | 2 | 3 | 22 | 2 | 3 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 4 |
| HS84 | 5 | 3 | —S— | —S— | —I— | —I— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | —S— | —S— | —S— |
| HS85 | 5 | 21 | —I— | 12 | —I— | —I— | —I— | —I— | —S— | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —S— | —S— | —I— |
| HS86 | 5 | 10 | —S— | 2 | —I— | 6 | 2 | 11 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | —S— | 3 | 2 | 48 | —I— | 5 | 3 | 18 |
| HS87 | 6 | 4 | 9 | —S— | —I— | —S— | —S— | —I— | —S— | —S— | 11 | —S— | —S— | —S— | 3 | 11 | 2 | 2 | —I— | —I— | 4 | 13 | —S— |
| HS88 | 2 | 1 | 14 | 15 | 13 | 14 | 11 | 13 | 14 | 16 | 14 | 14 | 14 | 15 | 15 | 8 | 16 | 6 | 21 | 38 | 26 | 22 | 36 |
| HS89 | 3 | 1 | ( 21) | ( 23) | ( 15) | ( 16) | ( 17) | ( 19) | ( 17) | ( 22) | ( 21) | ( 21) | 19 | ( 20) | ( 19) | ( 11) | ( 40) | —T— | ( 34) | ( 50) | ( 29) | ( 29) | ( 91) |
| HS9 | 2 | 1 | 0 | 0 | 1 | 0 | 1 | 3 | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| HS90 | 4 | 1 | —E— | —E— | —E— | —E— | —E— | 26 | —E— | —E— | —E— | 25 | —E— | —E— | —E— | 15 | 34 | 12 | —E— | 51 | —E— | —E— | —E— |
| HS91 | 5 | 1 | —E— | —E— | 32 | —E— | 40 | —E— | —E— | ( 89) | —E— | —E— | —E— | —E— | —E— | ( 35) | ( 61) | 14 | —E— | —I— | —E— | —E— | —E— |
| HS92 | 6 | 1 | —E— | —E— | —E— | —E— | —E— | 672 | —E— | —E— | —E— | —E— | 41 | 41 | —E— | 21 | 67 | 18 | —E— | —I— | —E— | —E— | —E— |
| HS93 | 6 | 2 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HS95 | 6 | 4 | 1 | 2 | —I— | 1 | 1 | 12 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 |
| HS96 | 6 | 4 | 1 | 2 | —I— | 1 | 4 | 11 | 1 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 2 |
| HS97 | 6 | 4 | 2 | ( 2) | ( 28) | ( 1) | ( 1) | ( 16) | ( 1) | ( 2) | 2 | ( 2) | ( 1) | ( 2) | ( 4) | 2 | ( 4) | ( 1) | ( 5) | —I— | ( 3) | ( 2) | ( 6) |
| HS98 | 6 | 4 | 2 | 4 | —I— | ( 1) | ( 1) | ( 16) | ( 1) | ( 3) | 2 | ( 2) | ( 1) | ( 1) | ( 4) | 3 | ( 3) | ( 1) | ( 2) | ( 3) | ( 2) | ( 2) | ( 5) |
| HS99 | 7 | 2 | —I— | —S— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —I— | —I— | —I— | —E— | —F— | —I— |
| HS99EXP | 31 | 21 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —F— | —I— | —F— | —I— | —I— | —E— | —I— | —I— | —I— | —I— | —I— | —I— |
| HUBFIT | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| HYDCAR20 | 99 | 99 | —F— | —E— | —F— | 140 | 422 | —E— | —F— | —F— | —F— | 93 | 118 | 174 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDCAR6 | 29 | 29 | —F— | —E— | —F— | 17 | —F— | 44 | —F— | —F— | —F— | 11 | 19 | 20 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| HYDROELL | 1009 | 1008 | 4726 | 14026 | —I— | —I— | 5953 | —I— | 5702 | 3076 | 6859 | 658 | 1703 | 1113 | 7620 | 6192 | —I— | 5408 | —I— | —I— | 9689 | 9266 | —I— |
| HYDROELM | 505 | 504 | 3577 | 3849 | —I— | —I— | 1678 | —I— | 1339 | 2344 | 5156 | 264 | 297 | 294 | 1768 | 2609 | —I— | 3286 | —I— | —I— | 3091 | —I— | —I— |
| HYDROELS | 169 | 168 | 156 | 336 | —I— | —I— | 80 | —I— | 68 | 103 | 222 | 36 | 50 | 31 | 104 | 170 | —I— | 176 | —I— | —I— | 592 | —I— | —I— |
| HYPCIR | 2 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| INTEGREQ | 12 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| INTEGREQ | 52 | 0 | 4 | 7 | 16 | 16 | 2 | 2 | 3 | 3 | 4 | 7 | 16 | 16 | 16 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| INTEGREQ | 102 | 0 | 20 | —S— | 193 | 201 | 8 | 8 | 20 | 19 | 22 | 80 | 194 | 193 | 193 | 20 | 20 | 21 | 15 | 15 | 15 | 15 | 15 |
| JENSMP | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 9 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | —I— | 1 | 1 | 1 |
| JNLBRNG1 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| JNLBRNG1 | 100 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 6 | 1 | 1 | 1 |
| JNLBRNG1 | 529 | 0 | 11 | —S— | 4 | 4 | 10 | 15 | 9 | 9 | 12 | 4 | 4 | 4 | 4 | 11 | 13 | 12 | 30 | 273 | 30 | 30 | 33 |
| JNLBRNG1 | 1024 | 0 | 32 | 35 | 10 | 10 | 31 | 48 | 28 | 27 | 37 | 11 | 11 | 11 | 11 | 32 | 29 | 34 | 104 | 1115 | 104 | 104 | 110 |
| JNLBRNG1 | 5625 | 0 | 913 | 708 | 191 | 206 | 980 | 1495 | 800 | 787 | 1063 | 210 | 225 | 211 | 203 | 907 | 734 | 782 | 3076 | —I— | 3087 | 3102 | 3132 |
| JNLBRNG1 | 10000 | 0 | 2805 | 1967 | 544 | 585 | 3086 | 4541 | 2417 | 2417 | 3285 | 648 | 637 | 589 | 568 | 2802 | 2489 | 2401 | 9767 | —T— | 9516 | 9635 | 9617 |
| JNLBRNG1 | 15625 | 0 | 7220 | —I— | 1245 | 1340 | 7110 | 11869 | 5911 | 6211 | 8381 | 1526 | 1475 | 1340 | 3646 | 7326 | 6711 | 5940 | 7309 | —T— | 7324 | 7347 | 7457 |
| JNLBRNG2 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| JNLBRNG2 | 100 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 13 | 1 | 1 | 1 |
| JNLBRNG2 | 529 | 0 | 7 | —S— | 2 | 2 | 11 | 11 | 6 | 6 | 8 | 3 | 2 | 2 | 4 | 7 | 7 | 8 | 12 | 566 | 12 | 12 | 13 |
| JNLBRNG2 | 1024 | 0 | 19 | 24 | 6 | 6 | 34 | 29 | 17 | 17 | 21 | 8 | 7 | 7 | 8 | 18 | 19 | 20 | 28 | 1384 | 28 | 28 | 31 |
| JNLBRNG2 | 5625 | 0 | 424 | 375 | 116 | 125 | 933 | 917 | 383 | 372 | 485 | 158 | 137 | 129 | 109 | 419 | 354 | 420 | 793 | —I— | 796 | 796 | 890 |
| JNLBRNG2 | 10000 | 0 | 1303 | 1111 | 296 | 321 | 2919 | 2535 | 1128 | 1145 | 1497 | 411 | 348 | 323 | 264 | 1293 | 1060 | 1275 | 2049 | —I— | 2044 | 2062 | 2247 |
| JNLBRNG2 | 15625 | 0 | 3548 | —I— | 665 | 716 | 7877 | 6181 | 3038 | 2899 | 3779 | 862 | 778 | 719 | 2773 | 3263 | 3186 | 2783 | 7525 | —T— | 7616 | 7592 | 8105 |
| KOWOSB | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | —S— | 1 | 3 | 3 |
| LCH | 30 | 1 | 5 | —F— | —I— | 5 | ( 4) | ( 5) | ( 3) | 4 | 4 | 6 | 6 | 5 | 6 | 4 | 4 | 4 | —I— | —I— | 10 | 12 | 16 |
| LCH | 150 | 1 | 16 | —F— | ( 48) | 1491 | ( 18) | 81 | 21 | 19 | 14 | 49 | 73 | 63 | 78 | 14 | 16 | 14 | —I— | —I— | 30 | 32 | 37 |
| LCH | 300 | 1 | 34 | —F— | 307 | 8093 | ( 58) | 286 | 57 | 53 | 30 | 239 | 436 | 362 | 453 | 28 | 29 | 31 | —I— | —I— | 62 | 91 | 116 |
| LCH | 600 | 1 | 78 | —F— | —T— | —T— | ( 172) | 1049 | 158 | 168 | 76 | 1663 | 3657 | 3005 | 4368 | 67 | 74 | 82 | —I— | —I— | 147 | 162 | 175 |
| LEAKNET | 156 | 153 | —S— | —F— | —I— | —I— | —I— | —I— | —S— | —I— | —S— | 41 | 31 | 30 | —I— | —S— | ( 1979) | —S— | —I— | —I— | —S— | —S— | —I— |
| LEWISPOL | 6 | 9 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| LIARWHD | 36 | 0 | 2 | 2 | 2 | 2 | 1 | 13 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 |
| LIARWHD | 100 | 0 | 4 | 5 | 3 | 3 | 2 | 22 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 4 | 4 | 3 |
| LIARWHD | 500 | 0 | 10 | 22 | 18 | 16 | 6 | 98 | 8 | 10 | 16 | 12 | 19 | 18 | 16 | 16 | 11 | 12 | 10 | 11 | 11 | 10 | 13 |
| LIARWHD | 1000 | 0 | 24 | 60 | 51 | 43 | 10 | 231 | 16 | 21 | 31 | 27 | 76 | 77 | 66 | 31 | 29 | 24 | 24 | 19 | 25 | 24 | 25 |
| LIARWHD | 5000 | 0 | 185 | 319 | 795 | 643 | 57 | 2077 | 73 | ( 100) | 152 | 231 | 1390 | 1386 | 1341 | 204 | 254 | 123 | 194 | ( 112) | 194 | 193 | 202 |
| LIARWHD | 10000 | 0 | ( 248) | 576 | 3162 | 2505 | 111 | 5719 | 146 | ( 399) | 539 | 513 | 5530 | 5542 | 4716 | 545 | 312 | 233 | ( 260) | ( 663) | ( 261) | ( 259) | ( 271) |

Cputimes (in seconds) ( 10 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LINVERSE | 19 | 0 | 2 | 5 | ( 36) | 2 | 2 | 3 | 2 | ( 1) | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 3 | —I— | —I— | 4 | 2 | —I— |
| LINVERSE | 199 | 0 | 15 | 64 | —I— | 30 | 14 | 68 | 12 | 16 | 17 | 49 | 31 | 40 | 47 | 33 | 18 | 47 | —I— | —I— | 25 | 23 | —I— |
| LINVERSE | 999 | 0 | 463 | ( 1935) | 273 | 3708 | 588 | 4506 | 178 | 325 | 568 | 740 | 340 | 375 | 302 | 658 | 297 | 1068 | —I— | —S— | 606 | 394 | 2566 |
| LINVERSE | 1999 | 0 | 1894 | —S— | 2927 | —T— | ( 999) | 12871 | 618 | 1468 | 2373 | 1858 | 1730 | 1253 | 1471 | 1536 | 2614 | 4129 | —I— | —S— | 1711 | 1455 | —I— |
| LMINSURF | 16 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 3 | 1 | 1 | 1 |
| LMINSURF | 49 | 0 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 16 | 3 | 2 | 3 |
| LMINSURF | 64 | 0 | 3 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 39 | 4 | 4 | —I— |
| LMINSURF | 121 | 0 | 11 | 11 | 4 | 5 | 9 | 8 | 8 | 11 | 3 | 4 | 4 | 4 | 7 | 10 | 9 | 9 | 12 | 133 | 12 | 12 | 12 |
| LMINSURF | 961 | 0 | 341 | 363 | 91 | 453 | 517 | 208 | 281 | 296 | 417 | 81 | 87 | 80 | 129 | 373 | 379 | 540 | 416 | —I— | 473 | 427 | 423 |
| LMINSURF | 1024 | 0 | 431 | 531 | 99 | 531 | 497 | 234 | 408 | 365 | 521 | 87 | 94 | 86 | 209 | 508 | 424 | 677 | 449 | —I— | 476 | 470 | —I— |
| LMINSURF | 5625 | 0 | —I— | —I— | 1850 | —T— | —I— | 4997 | —I— | —I— | —I— | 1777 | 1976 | 1768 | 7931 | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| LMINSURF | 10000 | 0 | —I— | —I— | 4593 | —T— | —I— | —I— | —I— | —I— | —I— | 4651 | 5078 | 4631 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —I— |
| LMINSURF | 15625 | 0 | —T— | —T— | 9868 | —T— | —I— | —I— | —T— | —T— | —T— | 9958 | 10993 | 9918 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| LSQFIT | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LUBRIF | 151 | 100 | —F— | —I— | —I— | —F— | —F— | —I— | —I— | —F— | —F— | —F— | —F— | —F— | —I— | —F— | —F— | —F— | —I— | —I— | —I— | —F— | —I— |
| LUBRIF | 751 | 500 | —T— | —T— | —I— | —I— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| MANCINO | 10 | 0 | 1 | —S— | 1 | 1 | 1 | 55 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| MANCINO | 20 | 0 | 3 | —S— | 3 | 3 | 2 | —I— | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 |
| MANCINO | 30 | 0 | 8 | —S— | 6 | 7 | 5 | —I— | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 8 | 8 | 9 | 8 | 8 | 8 | 8 | 8 |
| MANCINO | 50 | 0 | 27 | —S— | 28 | 29 | 17 | —I— | 26 | 26 | 28 | 38 | 54 | 56 | 54 | 25 | 30 | 31 | 28 | 28 | 27 | 27 | 27 |
| MANNE | 300 | 200 | 9 | 26 | —I— | 9 | 16 | 14 | 26 | 20 | 13 | 60 | 15 | 1274 | 10 | 11 | 8 | 10 | 52 | 51 | 12 | 12 | 12 |
| MANNE | 1095 | 730 | —S— | 2573 | —S— | 285 | 963 | 146 | —S— | 186 | —S— | —T— | 87 | —E— | 130 | 105 | 94 | 121 | 225 | 225 | 114 | 113 | —S— |
| MARATOS | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 |
| MARATOSB | 2 | 0 | —I— | —I— | —I— | —I— | —I— | 27 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| MATRIX2 | 6 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 |
| MAXLIKA | 8 | 0 | ( 7) | 30 | 31 | 17 | 20 | 25 | ( 6) | 18 | 20 | 21 | 19 | ( 7) | 19 | ( 7) | ( 7) | ( 6) | —I— | —S— | 423 | 118 | 527 |
| MCCORMCK | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 1 | 0 | 1 |
| MCCORMCK | 50 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 4 | 1 | 1 | 1 |
| MCCORMCK | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 1 | 1 | 1 |
| MCCORMCK | 500 | 0 | 3 | 5 | 3 | 3 | 2 | 3 | 3 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 4 | 25 | 4 | 4 | 5 |
| MCCORMCK | 1000 | 0 | 5 | 10 | 6 | 6 | 5 | 6 | 5 | 5 | 6 | 6 | 6 | 6 | 6 | 6 | 9 | 6 | 8 | 44 | 8 | 8 | 10 |
| MCCORMCK | 5000 | 0 | 26 | 33 | 28 | 29 | 21 | 28 | 27 | 22 | 32 | 30 | 30 | 30 | 26 | 28 | 40 | 28 | 40 | 244 | 41 | 41 | 49 |
| MCCORMCK | 10000 | 0 | 52 | 66 | 55 | 56 | 43 | 54 | 52 | 44 | 63 | 61 | 59 | 59 | 53 | 56 | 83 | 55 | 81 | 435 | 82 | 81 | 96 |
| MDHOLE | 2 | 0 | 5 | 3 | 3 | 5 | 5 | 14 | 5 | 5 | 5 | 6 | 6 | 5 | 6 | 5 | 3 | 3 | 5 | 4 | 5 | 5 | 4 |
| METHANB8 | 31 | 31 | —I— | —E— | 2 | 2 | 2 | 24 | —F— | —F— | 14 | 3 | 2 | 2 | —F— | —I— | —I— | —S— | —S— | —F— | —I— | —S— | —S— |
| METHANL8 | 31 | 31 | —F— | —E— | 106 | 47 | 26 | —E— | —F— | —F— | —F— | 39 | 47 | 18 | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— | —F— |
| MEXHAT | 2 | 0 | 2 | 1 | 1 | 2 | 3 | —I— | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 39 | 2 | 2 | 2 |
| MEYER3 | 3 | 0 | 42 | —S— | —I— | —I— | 43 | —I— | —S— | 41 | 42 | —S— | —S— | —S— | —S— | —S— | —I— | —S— | —S— | —S— | 57 | —S— | —I— |
| MINPERM | 5 | 5 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 |
| MINPERM | 13 | 10 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | —I— | 3 | 2 | 2 |
| MINPERM | 27 | 19 | 2 | 2 | 5 | 3 | 1 | 1 | 1 | 2 | 3 | 3 | 7 | 8 | 11 | 2 | 2 | 2 | 5 | —I— | 3 | 2 | 3 |
| MINPERM | 51 | 36 | 4 | 4 | 26 | 8 | 2 | 2 | 2 | 4 | 5 | 15 | 11 | 31 | 16 | 4 | 4 | 4 | 12 | —I— | 7 | 4 | 4 |
| MINPERM | 93 | 69 | 5 | 5 | 246 | 19 | 3 | 3 | 4 | 9 | 13 | 169 | 52 | 132 | 90 | 6 | 5 | 6 | 57 | —I— | 6 | 8 | 8 |
| MINPERM | 169 | 134 | 89 | 86 | —I— | 318 | 8 | 7 | 8 | 25 | 28 | 1030 | 1091 | 1518 | 629 | 85 | 28 | 142 | 605 | —T— | 35 | 33 | 33 |
| MINPERM | 311 | 263 | 104 | 102 | —I— | 1090 | 15 | 14 | 17 | 31 | 57 | 5175 | 2400 | 8223 | 4091 | 112 | 92 | 472 | 961 | —T— | 132 | 126 | 135 |
| MINPERM | 583 | 520 | 3247 | 3285 | —T— | —T— | 36 | 35 | 40 | 53 | 87 | —T— | —T— | —I— | 16976 | 4570 | 251 | 858 | —I— | —T— | 392 | 643 | 358 |
| MINPERM | 1113 | 1033 | 929 | 1054 | —T— | —T— | 92 | 83 | 100 | 145 | 132 | —T— | —T— | —T— | 4050 | 1745 | 1856 | 2076 | 6110 | —I— | 5867 | 2169 | 2568 |
| MINSURF | 64 | 0 | 2 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 10 | 2 | 2 | 2 |
| MISTAKE | 9 | 13 | 4 | 3 | 13 | 3 | 4 | 3 | 4 | 4 | 8 | 5 | 5 | 5 | 3 | 4 | 3 | 4 | 9 | —I— | 6 | 5 | 7 |
| MSQRTA | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 2 |
| MSQRTA | 49 | 0 | 6 | —I— | 11 | 11 | 7 | 7 | 7 | 6 | 8 | 8 | 10 | 10 | 13 | 7 | 8 | 8 | 9 | —I— | 7 | 10 | 11 |
| MSQRTA | 100 | 0 | 27 | 37 | 165 | 63 | 42 | 31 | 27 | 32 | 28 | 48 | 118 | 74 | 151 | 30 | 27 | 40 | 47 | —I— | 26 | 26 | 37 |
| MSQRTA | 529 | 0 | 4886 | 5571 | —T— | —T— | 4420 | 3790 | 5154 | 5453 | 4938 | —T— | —T— | —T— | —T— | 5259 | 5634 | 7484 | 9409 | —I— | 5411 | 4936 | 5851 |
| MSQRTA | 1024 | 0 | 15074 | 15688 | —T— | —T— | —T— | 14690 | 14307 | 9790 | 14736 | —T— | —T— | —T— | —T— | —T— | 11594 | —T— | —T— | —T— | 12434 | 11832 | —T— |
| MSQRTB | 9 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | —I— | 1 | 1 | 3 |
| MSQRTB | 49 | 0 | 8 | 17 | 0 | 10 | 9 | 9 | 8 | 8 | 10 | 8 | 13 | 11 | 17 | ( 1275) | 8 | 11 | 12 | —I— | 7 | 8 | 14 |
| MSQRTB | 100 | 0 | 34 | 45 | 0 | 73 | 37 | 41 | 33 | 34 | 34 | 42 | 165 | 77 | 202 | 37 | 28 | 56 | 47 | —I— | 32 | 33 | 49 |
| MSQRTB | 529 | 0 | 4116 | 4255 | —T— | —T— | 6506 | 3812 | 4098 | 4724 | 4182 | 11602 | —T— | —T— | —T— | 5568 | 4475 | 10135 | 6288 | —I— | 3828 | 3346 | 5131 |
| MSQRTB | 1024 | 0 | 8454 | 8812 | —T— | —T— | 9333 | 8328 | 9208 | 9034 | 10584 | —T— | —T— | —T— | —T— | 11605 | 7272 | 11329 | —T— | —T— | 6558 | 8330 | —T— |

Cputimes (in seconds) ( 11 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MWRIGHT | 5 | 3 | ( 2) | 1 | ( 1) | ( 1) | ( 2) | ( 4) | ( 2) | ( 2) | ( 2) | ( 3) | ( 2) | ( 2) | ( 2) | ( 2) | ( 2) | ( 1) | ( 45) | ( 53) | ( 3) | ( 2) | ( 3) |
| NGONE | 8 | 8 | 2 | 2 | 7 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 14 | —I— | 3 | 3 | 4 |
| NGONE | 12 | 19 | 6 | 7 | 22 | 5 | —E— | 4 | 5 | 6 | 7 | 5 | 6 | 6 | 5 | 6 | 5 | 6 | 14 | —I— | 7 | 6 | 7 |
| NGONE | 50 | 323 | —I— | —I— | —I— | —I— | ( 2701) | —I— | —I— | ( 381) | —I— | —I— | ( 199) | 618 | —I— | —I— | —I— | —I— | —I— | —I— | ( 2629) | —I— | —I— |
| NGONE | 100 | 1273 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —T— | 11492 | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —I— | —I— |
| NGONE | 500 | 31373 | —T— | —T— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —M— | —M— | —M— | —M— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NLMSURF | 16 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 1 | 1 | 1 |
| NLMSURF | 49 | 0 | 6 | 7 | 3 | 2 | 6 | 5 | 3 | 5 | 3 | 4 | 4 | 4 | 5 | 5 | 7 | 2 | 6 | 95 | 8 | 7 | 14 |
| NLMSURF | 64 | 0 | 7 | 9 | 2 | 3 | 9 | 8 | 7 | 7 | 2 | 3 | 3 | 3 | 8 | 7 | 8 | 4 | 8 | —I— | 8 | 8 | 19 |
| NLMSURF | 121 | 0 | 25 | 27 | 5 | 7 | 32 | 20 | 26 | 26 | 4 | 5 | 5 | 5 | 30 | 28 | 33 | 14 | 30 | —I— | 34 | 33 | 93 |
| NLMSURF | 961 | 0 | 1018 | 1216 | 67 | 334 | —I— | 775 | 997 | 923 | 1268 | 69 | 75 | 69 | 453 | 1227 | 1035 | 502 | 1157 | —I— | 1289 | 1152 | 1637 |
| NLMSURF | 1024 | 0 | 1331 | 1258 | 76 | 390 | —I— | 898 | 1105 | 1061 | 1612 | 79 | 85 | 78 | 617 | 1324 | 1192 | 537 | 1173 | —I— | 1319 | 1196 | 1504 |
| NLMSURF | 5625 | 0 | —I— | —I— | 1058 | 11020 | —I— | —I— | —I— | —I— | —I— | 1074 | 1175 | 1070 | —I— | —I— | —I— | 9186 | —I— | —I— | —I— | —I— | —I— |
| NLMSURF | 10000 | 0 | —I— | —I— | 2600 | —T— | —I— | —I— | —I— | —I— | —I— | 2633 | 2865 | 2617 | —T— | —I— | —I— | —T— | —I— | —T— | —I— | —I— | —E— |
| NLMSURF | 15625 | 0 | —T— | —T— | 6014 | —T— | —I— | —I— | —T— | —T— | —T— | 6161 | 6620 | 6064 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONDIA | 10 | 0 | 2 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 4 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 |
| NONDIA | 20 | 0 | 3 | 2 | 3 | 3 | 2 | 5 | 2 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | 2 | 2 | 2 |
| NONDIA | 30 | 0 | 6 | 3 | 5 | 5 | 3 | 9 | 10 | 4 | 8 | 5 | 5 | 4 | 4 | 8 | 4 | 5 | 4 | 4 | 4 | 4 | 3 |
| NONDIA | 50 | 0 | 9 | 4 | 6 | 8 | 3 | 12 | 24 | 5 | 19 | 18 | 5 | 7 | 6 | 7 | 7 | 7 | 6 | 7 | 9 | 9 | 7 |
| NONDIA | 90 | 0 | 17 | 9 | 11 | 18 | 4 | 20 | 11 | 20 | 28 | 11 | 11 | 11 | 9 | 27 | 10 | 19 | 18 | 18 | 29 | 29 | 27 |
| NONDIA | 100 | 0 | 23 | 8 | 12 | 22 | 5 | 22 | 19 | 8 | 15 | 39 | 12 | 11 | 10 | 17 | 11 | 23 | 19 | 19 | 25 | 24 | 22 |
| NONDIA | 500 | 0 | 176 | 33 | 48 | 959 | 17 | 135 | 74 | 113 | 196 | 99 | 61 | 60 | 57 | 60 | 40 | 493 | 27 | 27 | 184 | 181 | 176 |
| NONDIA | 1000 | 0 | 269 | 54 | 126 | 6646 | 29 | 344 | 194 | 193 | 421 | 472 | 162 | 161 | 165 | 84 | 77 | 4603 | 82 | 105 | 83 | 82 | 81 |
| NONDIA | 5000 | 0 | 571 | ( 449) | 1992 | —T— | 135 | —I— | 577 | 770 | 572 | 1643 | 3073 | 3082 | 2778 | 819 | 405 | —T— | 521 | 525 | 859 | 858 | 612 |
| NONDIA | 10000 | 0 | 1461 | 1203 | 6881 | —T— | 269 | —I— | 2244 | 665 | 952 | 6037 | 13206 | 13144 | 10652 | 1367 | 714 | —T— | 1051 | 1143 | 1047 | 1029 | 984 |
| NONDQUAR | 100 | 0 | 3 | 2 | 4 | 4 | 13 | 16 | 16 | 2 | 3 | 4 | 5 | 4 | 4 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| NONDQUAR | 500 | 0 | 8 | 8 | 27 | 27 | 49 | 165 | 52 | 6 | 12 | 21 | 40 | 35 | 24 | 8 | 9 | 8 | 8 | 8 | 8 | 8 | 8 |
| NONDQUAR | 1000 | 0 | 16 | 18 | 89 | 88 | 101 | 547 | 141 | 12 | 23 | 61 | 128 | 122 | 78 | 16 | 15 | 17 | 16 | 16 | 16 | 16 | 15 |
| NONDQUAR | 5000 | 0 | 78 | 77 | 2096 | 2079 | 453 | 9817 | 560 | 58 | 115 | 1344 | 3102 | 3090 | 2005 | 79 | 90 | 85 | 78 | 77 | 78 | 78 | 82 |
| NONMSQRT | 9 | 0 | 12 | 14 | —I— | —I— | ( 9) | —I— | ( 10) | ( 13) | 11 | ( 12) | ( 51) | 12 | 12 | 10 | ( 9) | ( 7) | —I— | —S— | 11 | 9 | —I— |
| NONMSQRT | 49 | 0 | —I— | —I— | —I— | —I— | ( 167) | —I— | ( 704) | —I— | ( 2830) | 95 | —I— | 101 | ( 1535) | —I— | —I— | —T— | —I— | —S— | —I— | —I— | —I— |
| NONMSQRT | 100 | 0 | —T— | —T— | —I— | —I— | 1306 | —I— | ( 5870) | —T— | —I— | —S— | —T— | —S— | —I— | —T— | —T— | —T— | —I— | —S— | —T— | —T— | —I— |
| NONMSQRT | 529 | 0 | —T— | —T— | —I— | —I— | —T— | —I— | —T— | —T— | —T— | —S— | —T— | —S— | —T— | —T— | —T— | —T— | —E— | —I— | —T— | —T— | —T— |
| NONMSQRT | 1024 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| NONSCOMP | 25 | 0 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NONSCOMP | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 4 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NONSCOMP | 100 | 0 | 1 | 1 | 2 | 2 | 2 | 5 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NONSCOMP | 500 | 0 | 4 | 5 | 5 | 5 | 5 | 12 | 5 | 4 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 3 | 3 | 5 | 4 | 5 |
| NONSCOMP | 1000 | 0 | 8 | 9 | 10 | 10 | 8 | 24 | 10 | 6 | 11 | 12 | 10 | 10 | 9 | 9 | 10 | 10 | 6 | 5 | 8 | 8 | 9 |
| NONSCOMP | 5000 | 0 | 39 | 42 | 46 | 48 | 40 | 113 | 48 | 30 | 54 | 57 | 51 | 50 | 43 | 42 | 52 | 50 | 28 | 28 | 40 | 39 | 42 |
| NONSCOMP | 10000 | 0 | 76 | 85 | 91 | 97 | 81 | 220 | 81 | 60 | 108 | 111 | 100 | 98 | 84 | 82 | 109 | 99 | 55 | 55 | 79 | 78 | 85 |
| NYSTROM5 | 18 | 20 | —F— | —F— | —F— | 5 | 3 | 12 | 3 | 5 | —F— | 6 | 7 | —F— | 9 | —F— | —F— | 6 | 15 | —F— | 10 | —F— | —F— |
| OBSTCLAE | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLAE | 100 | 0 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 2 | 7 | 2 | 2 | 3 |
| OBSTCLAE | 529 | 0 | 33 | 41 | 88 | 36 | 19 | 20 | 22 | 24 | 43 | 50 | 42 | 42 | 31 | 33 | 40 | 34 | 39 | 157 | 39 | 39 | 41 |
| OBSTCLAE | 1024 | 0 | 126 | 152 | 369 | 208 | 74 | 71 | 78 | 93 | 167 | 211 | 180 | 180 | 122 | 124 | 144 | 134 | 144 | 545 | 143 | 143 | 149 |
| OBSTCLAE | 5625 | 0 | 4846 | 4953 | 15566 | —T— | 2782 | 3561 | 3234 | 3574 | 6739 | 7633 | 7572 | 7522 | 4333 | 4845 | 5020 | 4860 | 5080 | —I— | 5036 | 5023 | 5134 |
| OBSTCLAE | 10000 | 0 | 16010 | 16202 | —T— | —T— | 9153 | 11461 | 10861 | 11680 | —T— | —T— | —T— | —T— | —T— | 16229 | 16488 | 16070 | 16740 | —T— | 16589 | 16768 | 16684 |
| OBSTCLAE | 15625 | 0 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| OBSTCLAL | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLAL | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 6 | 1 | 1 | 2 |
| OBSTCLAL | 529 | 0 | 7 | 9 | 4 | 4 | 7 | 7 | 7 | 6 | 7 | 5 | 5 | 5 | 4 | 7 | 8 | 7 | 9 | 83 | 8 | 8 | 34 |
| OBSTCLAL | 1024 | 0 | 17 | 22 | 9 | 9 | 18 | 19 | 18 | 15 | 19 | 10 | 10 | 10 | 10 | 17 | 21 | 17 | 23 | 277 | 23 | 22 | 30 |
| OBSTCLAL | 5625 | 0 | 305 | 277 | 127 | 133 | 370 | 351 | 347 | 275 | 343 | 138 | 149 | 139 | 146 | 308 | 283 | 268 | 388 | —I— | 383 | 385 | 427 |
| OBSTCLAL | 10000 | 0 | 849 | 824 | 278 | 299 | 1049 | 944 | 969 | 774 | 957 | 306 | 320 | 306 | 337 | 854 | 735 | 698 | 982 | —I— | 969 | 965 | 1404 |
| OBSTCLAL | 15625 | 0 | 1900 | 1767 | 590 | 624 | 2438 | 2094 | 2168 | 1715 | 2153 | 644 | 676 | 642 | 682 | 1907 | 1603 | 1542 | 2018 | —T— | 1990 | 1985 | 2128 |
| OBSTCLBL | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBL | 100 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 4 | 1 | 1 | 1 |
| OBSTCLBL | 529 | 0 | 12 | 26 | 13 | 6 | 9 | 9 | 10 | 10 | 14 | 11 | 11 | 11 | 10 | 13 | 9 | 14 | 13 | 141 | 13 | 13 | 14 |

Cputimes (in seconds) ( 12 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| OBSTCLBL | 1024 | 0 | 50 | 97 | 65 | 22 | 36 | 39 | 42 | 40 | 63 | 43 | 43 | 43 | 40 | 51 | 39 | 50 | 43 | 621 | 42 | 42 | 46 |
| OBSTCLBL | 5625 | 0 | 1159 | —S— | 1899 | 670 | 842 | 912 | 940 | 902 | 1499 | 1168 | 1172 | 1170 | 1003 | 1219 | 2082 | 1154 | 972 | —I— | 965 | 965 | 1977 |
| OBSTCLBL | 10000 | 0 | 3881 | —S— | 7839 | 2367 | 2983 | 2836 | 3285 | 2988 | 5009 | 4030 | 4026 | 3995 | 12075 | 3941 | 6894 | 3817 | 3266 | —T— | 3049 | 3302 | 4990 |
| OBSTCLBL | 15625 | 0 | 9456 | —S— | —T— | 6136 | 7384 | 6685 | 8156 | 7234 | 12420 | 9856 | 9884 | 9833 | —T— | 9580 | 16530 | 9209 | 9052 | —T— | 9120 | 9438 | 11178 |
| OBSTCLBM | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBM | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 |
| OBSTCLBM | 529 | 0 | 8 | 20 | 3 | 4 | 6 | 7 | 7 | 7 | 10 | 6 | 6 | 6 | 6 | 6 | 8 | 9 | 7 | 77 | 7 | 7 | 8 |
| OBSTCLBM | 1024 | 0 | 36 | 121 | 12 | 19 | 25 | 23 | 29 | 29 | 46 | 33 | 33 | 33 | 30 | 17 | 37 | 41 | 30 | 494 | 29 | 29 | 32 |
| OBSTCLBM | 5625 | 0 | 879 | 3651 | 320 | 714 | 561 | 553 | 655 | 666 | 1151 | 977 | 979 | 974 | 795 | 308 | 853 | 907 | 561 | —I— | 562 | 565 | 583 |
| OBSTCLBM | 10000 | 0 | 2619 | 10888 | 1138 | 2530 | 1648 | 1676 | 1947 | 1955 | 3463 | 3169 | 3141 | 3135 | —T— | 838 | 3375 | 2640 | 2110 | —T— | 2122 | 2082 | 2183 |
| OBSTCLBM | 15625 | 0 | 7307 | —T— | 3666 | 8557 | 4525 | 4580 | 5267 | 5408 | 9809 | 9502 | 9602 | 9439 | —T— | 2308 | 15096 | 7525 | 3968 | —T— | 3982 | 3958 | 4060 |
| OBSTCLBU | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OBSTCLBU | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 4 | 1 | 1 | 1 |
| OBSTCLBU | 529 | 0 | 7 | 10 | 5 | 5 | 7 | 7 | 7 | 6 | 8 | 5 | 6 | 5 | 5 | 7 | 7 | 8 | 13 | 166 | 13 | 13 | 15 |
| OBSTCLBU | 1024 | 0 | 18 | 32 | 12 | 10 | 17 | 18 | 18 | 16 | 21 | 11 | 12 | 11 | 11 | 19 | 18 | 22 | 41 | 524 | 41 | 40 | 55 |
| OBSTCLBU | 5625 | 0 | 379 | 1033 | 229 | 183 | 379 | 351 | 397 | 329 | 456 | 219 | 231 | 218 | 205 | 373 | 544 | 422 | 536 | —I— | 535 | 531 | 619 |
| OBSTCLBU | 10000 | 0 | 1255 | 3027 | 572 | 433 | 1172 | 1096 | 1174 | 980 | 1376 | 507 | 521 | 504 | 479 | 1091 | 2027 | 1110 | 1604 | —T— | 1606 | 1598 | 2258 |
| OBSTCLBU | 15625 | 0 | 2602 | 7488 | 734 | 927 | 2824 | 2372 | 2810 | 2140 | 3250 | 1088 | 1118 | 1084 | 3931 | 2881 | 5344 | 2634 | 3816 | —T— | 3816 | 3809 | 5389 |
| OPTCNTRL | 32 | 20 | 3 | 2 | 4 | 2 | 4 | 47 | 5 | 5 | 3 | 4 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 4 | 3 | 3 | 3 |
| OPTMASS | 70 | 55 | —I— | 89 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| OPTMASS | 610 | 505 | —I— | —F— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 1210 | 1005 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —E— | —I— | —I— | —I— | —I— |
| OPTMASS | 3010 | 2505 | —I— | —F— | —T— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —T— | —I— | —I— | —I— | —T— | —E— | —I— | —I— | —I— | —I— |
| ORTHREGA | 133 | 64 | 58 | —S— | 533 | —I— | —S— | —I— | 49 | 54 | 82 | 174 | 37 | 572 | 111 | 58 | 56 | 145 | —I— | —I— | 116 | 75 | —I— |
| ORTHREGA | 517 | 256 | 242 | 540 | —T— | —I— | 282 | —I— | 228 | 272 | 311 | 3024 | 213 | —T— | 1630 | 242 | 234 | 1286 | —I— | —I— | 424 | 321 | —I— |
| ORTHREGA | 2053 | 1024 | 1069 | —S— | —M— | —I— | 1689 | —I— | 992 | 1114 | —S— | —T— | 2547 | —E— | —T— | 1141 | 1122 | 12052 | —I— | —I— | 1790 | 1472 | —I— |
| ORTHREGA | 8197 | 4096 | —S— | —S— | —M— | —T— | 6672 | —I— | 4685 | —S— | 6458 | —E— | —T— | —E— | —T— | 5114 | 5616 | —T— | —I— | —I— | —S— | —S— | —T— |
| ORTHREGB | 27 | 6 | 14 | 34 | —I— | 14 | 2 | —I— | 63 | 12 | 12 | 46 | 19 | 30 | 26 | 15 | 19 | 56 | 21 | —I— | 17 | 12 | 35 |
| ORTHREGC | 25 | 10 | 5 | 8 | ( 8) | 5 | 4 | ( 37) | 8 | 6 | 6 | 6 | 5 | —I— | 6 | 5 | 4 | ( 7) | —I— | —I— | ( 7) | ( 11) | ( 10) |
| ORTHREGC | 105 | 50 | ( 27) | 143 | 27 | ( 150) | 18 | —I— | 22 | ( 17) | ( 30) | 25 | 16 | 20 | ( 79) | ( 23) | 12 | ( 41) | —I— | —I— | 29 | 27 | 87 |
| ORTHREGC | 505 | 250 | ( 81) | 210 | 729 | ( 898) | 73 | —I— | 79 | ( 89) | ( 106) | 105 | 76 | 166 | 191 | 61 | 59 | ( 600) | —I— | —I— | 94 | 119 | 439 |
| ORTHREGC | 1005 | 500 | 129 | —S— | 3725 | ( 3550) | 152 | —I— | 175 | 146 | 164 | 294 | 239 | 844 | 566 | 130 | 142 | ( 2657) | —I— | —I— | ( 233) | ( 247) | ( 1272) |
| ORTHREGC | 5005 | 2500 | 1031 | —T— | —T— | —T— | 1674 | —I— | 1467 | 919 | 1101 | 4406 | 6012 | —M— | 14422 | 1163 | 1057 | —T— | —I— | —I— | 1398 | 1610 | —I— |
| ORTHREGC | 10005 | 5000 | 2333 | —T— | —M— | —T— | 3349 | —I— | 3113 | 1967 | —S— | —T— | 16014 | —M— | —T— | 2574 | 2397 | —T— | —T— | —T— | 3488 | 3655 | —T— |
| ORTHREGD | 23 | 10 | 50 | —F— | 14 | 12 | 4 | —I— | 54 | 47 | 44 | 23 | 9 | 12 | 19 | 62 | 28 | 13 | 42 | 60 | 41 | 37 | 52 |
| ORTHREGD | 103 | 50 | 165 | —F— | 167 | 71 | 11 | —I— | 240 | 163 | 195 | 78 | 33 | —S— | 43 | —S— | —S— | 142 | 97 | —I— | 91 | 96 | 148 |
| ORTHREGD | 503 | 250 | 420 | —F— | —I— | —I— | 33 | —I— | —I— | 320 | 468 | 246 | 142 | 700 | 249 | —S— | —S— | 1428 | 243 | —S— | 208 | —S— | —I— |
| ORTHREGD | 1003 | 500 | 588 | —F— | —I— | —I— | 78 | —I— | —I— | 638 | 773 | 685 | 525 | —S— | 593 | —S— | —S— | 4531 | 359 | —S— | 374 | 404 | —I— |
| ORTHREGD | 5003 | 2500 | 2003 | —F— | —T— | —T— | 502 | —I— | 8968 | 1664 | —S— | 11647 | 10672 | —T— | 7288 | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —I— |
| ORTHREGD | 10003 | 5000 | 3130 | —F— | —M— | —T— | 1239 | —T— | —S— | 2208 | 3662 | —T— | —T— | —E— | —T— | —S— | —S— | —T— | —S— | —I— | —S— | —S— | —T— |
| ORTHREGE | 36 | 20 | —S— | ( 28) | ( 29) | —I— | 8 | —I— | —S— | —S— | ( 61) | ( 18) | —I— | —I— | —I— | —S— | ( 22) | —S— | —I— | —I— | —I— | —S— | —I— |
| ORTHREGF | 80 | 25 | 12 | 49 | 26 | 18 | 7 | 21 | 14 | 13 | 14 | 9 | 13 | 12 | 17 | 13 | 10 | 18 | 19 | —I— | 14 | 16 | 20 |
| ORTHREGF | 152 | 49 | 20 | —I— | 29 | 47 | 8 | 23 | 26 | 30 | 26 | 15 | 23 | 25 | 30 | 23 | 20 | 58 | 86 | —I— | 36 | 44 | 35 |
| ORTHREGF | 305 | 100 | ( 39) | —I— | ( 112) | 101 | 20 | ( 110) | ( 53) | ( 62) | ( 56) | ( 51) | 38 | 66 | ( 106) | ( 56) | ( 40) | ( 209) | —I— | —I— | ( 37) | ( 46) | ( 45) |
| ORTHREGF | 680 | 225 | ( 157) | ( 365) | 380 | ( 231) | 50 | ( 307) | ( 140) | ( 170) | ( 125) | ( 130) | 112 | 204 | ( 356) | ( 135) | ( 190) | 724 | —I— | —I— | ( 137) | ( 112) | ( 427) |
| ORTHREGF | 1205 | 400 | —S— | —S— | ( 2001) | ( 1286) | 121 | ( 1246) | ( 331) | ( 367) | ( 983) | ( 283) | 263 | 519 | 755 | ( 383) | ( 332) | ( 1740) | —I— | —I— | ( 242) | ( 272) | ( 291) |
| OSBORNEA | 5 | 0 | 4 | —E— | 5 | 1 | 7 | —I— | 8 | 9 | 4 | 8 | 4 | 6 | 5 | 4 | 5 | 5 | 15 | —S— | 10 | 7 | 8 |
| OSBORNEB | 11 | 0 | 7 | 7 | 5 | 7 | 10 | —E— | 6 | 5 | 8 | 9 | 7 | 7 | 4 | 8 | ( 17) | 8 | 28 | —I— | 8 | 15 | 13 |
| PALMER1 | 4 | 0 | 3 | —S— | 29 | 2 | 3 | 25 | 3 | 3 | 3 | 5 | 4 | 4 | 5 | 3 | 3 | 2 | 4 | —S— | 5 | 3 | —S— |
| PALMER1A | 6 | 0 | 7 | 6 | 9 | —S— | 19 | —I— | —S— | 12 | 7 | 13 | 9 | 12 | 9 | 8 | 6 | 6 | 21 | —I— | 9 | 12 | 14 |
| PALMER1B | 4 | 0 | 4 | 3 | 12 | 3 | 4 | —I— | 4 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 8 | —S— | 5 | 6 | 6 |
| PALMER1C | 8 | 0 | 2 | 2 | 1 | 1 | 11 | —I— | 4 | —S— | 5 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| PALMER1D | 7 | 0 | 2 | 1 | 1 | 1 | 7 | —I— | 1 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| PALMER1E | 8 | 0 | 42 | 27 | —I— | 7 | 42 | —I— | 33 | 22 | 41 | 20 | 104 | 107 | 41 | 33 | 22 | 23 | —I— | —I— | 42 | 29 | 31 |
| PALMER2 | 4 | 0 | 2 | 3 | 6 | 4 | 3 | 14 | 3 | 2 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 3 | 13 | —S— | 4 | 3 | 4 |
| PALMER2A | 6 | 0 | 15 | 11 | 9 | 6 | 11 | 43 | 11 | 20 | 16 | 18 | 14 | 11 | 13 | 16 | 13 | 12 | 50 | —I— | 17 | 18 | 22 |
| PALMER2B | 4 | 0 | 9 | 6 | 8 | 2 | 4 | —I— | 7 | 9 | 9 | 7 | 10 | 10 | 10 | 2 | 1 | 2 | 9 | —S— | 9 | 10 | —S— |
| PALMER2C | 8 | 0 | 2 | —S— | 1 | 1 | 5 | —I— | 4 | 2 | 2 | 2 | 1 | 1 | 2 | 5 | 2 | 2 | 2 | 2 | 2 | 2 | 1 |
| PALMER2E | 8 | 0 | 16 | 14 | 26 | 7 | 20 | —I— | 30 | 34 | 38 | 25 | 43 | 36 | 45 | 23 | 16 | 24 | —I— | —I— | 23 | 33 | 29 |

Cputimes (in seconds) ( 13 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PALMER3 | 4 | 0 | 4 | 3 | 3 | 3 | ( 3) | 11 | ( 4) | 4 | 4 | ( 4) | 4 | 5 | 6 | 6 | 1 | 3 | ( 7) | —I— | ( 5) | ( 6) | 13 |
| PALMER3A | 6 | 0 | 15 | 11 | 10 | 9 | 16 | —I— | 12 | 18 | 15 | 21 | 15 | 12 | 12 | 17 | 12 | 11 | —I— | —S— | 20 | 18 | 19 |
| PALMER3B | 4 | 0 | 6 | 4 | 6 | 2 | 3 | 9 | 4 | 8 | 6 | 4 | 5 | 7 | 3 | 2 | 2 | 2 | 4 | —S— | 3 | 2 | 2 |
| PALMER3C | 8 | 0 | 2 | 2 | 1 | 1 | 2 | —I— | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| PALMER3E | 8 | 0 | 10 | ( 9) | 3 | 4 | 15 | —I— | 22 | 20 | 28 | 12 | 6 | 5 | 30 | 12 | 8 | 16 | —I— | —I— | 17 | 18 | 21 |
| PALMER4 | 4 | 0 | 4 | 3 | ( 4) | 4 | ( 3) | 9 | ( 3) | 4 | 4 | ( 3) | 5 | 7 | 5 | 4 | 2 | 4 | —I— | —S— | ( 7) | 4 | —S— |
| PALMER4A | 6 | 0 | 5 | 5 | 16 | 6 | 8 | —I— | 6 | 8 | 5 | 12 | 11 | 7 | 9 | 7 | 5 | 5 | 11 | —I— | 8 | 11 | 10 |
| PALMER4B | 4 | 0 | 3 | 2 | 5 | 2 | 4 | 9 | 3 | 8 | 3 | 4 | 7 | 4 | 4 | —S— | 2 | 2 | 2 | —I— | 3 | 2 | 2 |
| PALMER4C | 8 | 0 | 5 | 3 | 1 | 1 | 6 | —I— | 3 | 2 | 4 | 2 | 1 | 1 | 3 | 3 | 3 | 2 | 5 | 5 | 5 | 5 | 4 |
| PALMER4E | 8 | 0 | 7 | 7 | 4 | 3 | 11 | —I— | 11 | 9 | 13 | 10 | 8 | 3 | 22 | 7 | 11 | 8 | —I— | —I— | 9 | 21 | 27 |
| PENALTY1 | 4 | 0 | 3 | 2 | 3 | 2 | 3 | 6 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 2 | 2 | 2 | 4 | 4 | 3 | 3 | 2 |
| PENALTY1 | 10 | 0 | 4 | 4 | 2 | 4 | 2 | 14 | 4 | 4 | 3 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 5 | 3 | 5 | 4 | 4 |
| PENALTY1 | 50 | 0 | 12 | 21 | 15 | 26 | 6 | —I— | 7 | 10 | 11 | 17 | 20 | 19 | 20 | 8 | 7 | 18 | 11 | 14 | 11 | 10 | 15 |
| PENALTY1 | 100 | 0 | 19 | 27 | 54 | 122 | 7 | —I— | 11 | 20 | 20 | 65 | 85 | 81 | 84 | 18 | 15 | 45 | 20 | 26 | 19 | 18 | 19 |
| PENALTY1 | 500 | 0 | 133 | 183 | 4484 | 12500 | 45 | —I— | 93 | 189 | 161 | 5425 | 8116 | 7789 | 7890 | 114 | 104 | 482 | 149 | 208 | 148 | 147 | 146 |
| PENALTY1 | 1000 | 0 | 430 | 404 | —T— | —T— | 150 | —I— | 310 | 354 | 469 | —T— | —T— | —T— | —T— | 287 | 316 | 1710 | 439 | 512 | 436 | 433 | 517 |
| PENALTY2 | 4 | 0 | 1 | 4 | 4 | 3 | 1 | 1 | 1 | 1 | 1 | 5 | 4 | 5 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| PENALTY2 | 10 | 0 | 9 | 19 | 3 | 5 | 2 | 15 | 5 | 2 | 10 | 12 | 7 | 7 | 12 | 10 | 7 | 4 | 9 | 3 | 9 | 9 | 8 |
| PENALTY2 | 50 | 0 | 8 | 7 | 12 | 12 | 5 | 15 | 5 | 12 | 12 | 22 | 16 | 15 | 18 | 10 | 6 | 12 | 9 | 16 | 9 | 9 | 8 |
| PENALTY2 | 100 | 0 | 6 | 7 | 34 | 33 | 6 | 60 | 6 | 6 | 8 | 24 | 40 | 37 | 39 | 7 | 6 | 6 | 8 | 28 | 7 | 7 | 7 |
| PENALTY3 | 50 | 0 | 72 | —S— | —S— | —S— | 55 | —I— | —S— | 75 | —S— | 135 | 111 | 124 | —S— | ( 1058) | —S— | 110 | —I— | —S— | —S— | 335 | —S— |
| PENALTY3 | 100 | 0 | —S— | —S— | —S— | —S— | 361 | —I— | 371 | —S— | 344 | 942 | —S— | 714 | —S— | —I— | 352 | —S— | —I— | —T— | —S— | 1504 | —S— |
| PENTAGON | 6 | 15 | 1 | 8 | 5 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 4 | —I— | 6 | 4 | 5 |
| POWELLBS | 2 | 0 | 4 | 3 | 4 | 2 | 4 | 33 | 4 | 4 | 4 | 5 | 4 | 4 | 4 | 4 | 2 | 2 | 4 | 4 | 5 | 4 | —S— |
| POWELLSG | 4 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| POWELLSG | 8 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| POWELLSG | 16 | 0 | 2 | 1 | 1 | 2 | 2 | 3 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| POWELLSG | 20 | 0 | 1 | 1 | 1 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| POWELLSG | 36 | 0 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| POWELLSG | 40 | 0 | 2 | 1 | 1 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| POWELLSG | 60 | 0 | 2 | 2 | 1 | 2 | 2 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| POWELLSG | 80 | 0 | 2 | 2 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| POWELLSG | 100 | 0 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| POWELLSG | 500 | 0 | 7 | 7 | 7 | 10 | 6 | 11 | 6 | 6 | 10 | 8 | 8 | 8 | 8 | 7 | 6 | 12 | 7 | 10 | 7 | 7 | 6 |
| POWELLSG | 1000 | 0 | 12 | 13 | 13 | 28 | 10 | 20 | 12 | 11 | 18 | 15 | 15 | 15 | 14 | 13 | 13 | 36 | 12 | 18 | 12 | 12 | 12 |
| POWELLSG | 5000 | 0 | 60 | 67 | 62 | 1044 | 48 | 91 | 56 | 56 | 90 | 72 | 73 | 71 | 68 | 61 | 59 | 1251 | 60 | 60 | 60 | 60 | 59 |
| POWELLSG | 10000 | 0 | 118 | 133 | 124 | 5994 | 97 | 181 | 112 | 111 | 180 | 142 | 146 | 142 | 135 | 123 | 119 | 6449 | 119 | 119 | 120 | 119 | 118 |
| POWELLSQ | 2 | 0 | 0 | 1 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 2 | 2 | 1 |
| POWER | 10 | 0 | 2 | 2 | 2 | 1 | 2 | 4 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 1 |
| POWER | 20 | 0 | 2 | 3 | 3 | 2 | 2 | 8 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| POWER | 30 | 0 | 2 | 3 | 4 | 3 | 2 | 14 | 2 | 2 | 2 | 3 | 4 | 4 | 4 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| POWER | 50 | 0 | 3 | 4 | 8 | 8 | 3 | 36 | 2 | 2 | 3 | 6 | 9 | 8 | 9 | 3 | 2 | 2 | 3 | 2 | 3 | 3 | 3 |
| POWER | 75 | 0 | 3 | 5 | 18 | 18 | 3 | 86 | 3 | 3 | 4 | 14 | 22 | 20 | 21 | 3 | 3 | 3 | 4 | 3 | 4 | 4 | 3 |
| POWER | 100 | 0 | 5 | 5 | 36 | 43 | 4 | 177 | 4 | 4 | 5 | 26 | 45 | 42 | 44 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 |
| POWER | 500 | 0 | 37 | 50 | 3037 | 3438 | 23 | —I— | 33 | 33 | 44 | 2217 | 4554 | 4309 | 4531 | 37 | 37 | 38 | 37 | 32 | 37 | 36 | 37 |
| POWER | 1000 | 0 | 124 | 139 | —T— | —T— | 61 | —I— | 115 | 117 | 138 | —T— | —T— | —T— | —T— | 124 | 133 | 139 | 126 | 102 | 127 | 125 | 128 |
| PROBPENL | 10 | 0 | 9 | 6 | ( 0) | —I— | ( 4) | ( 1) | ( 0) | ( 0) | ( 2) | ( 0) | ( 0) | ( 0) | ( 5) | 9 | ( 0) | ( 2) | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) |
| PROBPENL | 50 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 |
| PROBPENL | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 2 | 2 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| PROBPENL | 500 | 0 | 2 | —S— | 1 | 1 | 1 | 4 | 2 | 2 | 2 | 103 | 173 | 164 | 169 | 2 | 6 | 2 | 5 | 5 | 3 | 3 | 4 |
| PRODPL0 | 60 | 29 | —S— | —S— | —I— | 97 | 7 | 17 | 6 | 8 | —S— | 8 | 10 | 14 | 7 | 9 | —S— | —S— | 11 | 191 | —S— | 10 | 24 |
| PRODPL1 | 60 | 29 | 17 | 15 | —I— | —I— | 12 | 40 | 11 | 14 | 15 | 14 | 18 | 12 | 14 | 18 | 18 | 26 | 17 | —I— | 19 | 19 | 43 |
| PSPDOC | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| QUARTC | 25 | 0 | 2 | 2 | 1 | 1 | 2 | 91 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 |
| QUARTC | 100 | 0 | 4 | 4 | 3 | 3 | 4 | —I— | 3 | 3 | 5 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 4 | 4 | 4 | 4 | 3 |
| QUARTC | 500 | 0 | 14 | 19 | 10 | 10 | 14 | —I— | 10 | 11 | 19 | 14 | 14 | 14 | 12 | 13 | 13 | 14 | 14 | 13 | 14 | 13 | 13 |
| QUARTC | 1000 | 0 | 27 | 58 | 20 | 20 | 30 | —I— | 20 | 21 | 37 | 27 | 26 | 27 | 22 | 24 | 25 | 28 | 27 | 26 | 27 | 26 | 26 |
| QUARTC | 5000 | 0 | 150 | 1137 | 109 | 113 | 216 | —I— | 112 | 117 | 213 | 149 | 147 | 149 | 127 | 129 | 156 | 167 | 153 | 165 | 146 | 151 | 149 |
| QUARTC | 10000 | 0 | 319 | 4301 | ( 235) | ( 232) | 510 | —I— | 241 | 243 | 453 | 319 | 313 | 315 | 265 | 273 | 333 | 354 | 321 | 322 | 319 | 322 | 312 |

Cputimes (in seconds) ( 14 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| READING1 | 202 | 100 | 1051 | —F— | —I— | —I— | 2627 | 3395 | —I— | —I— | 1189 | 427 | —I— | 477 | —I— | 967 | 667 | 1575 | —I— | —I— | 936 | —I— | —I— |
| READING2 | 303 | 200 | 109 | 6338 | —I— | —I— | —T— | 3410 | 403 | 470 | 160 | 141 | 166 | 142 | 167 | 121 | 134 | 126 | 109 | 109 | 110 | 110 | 109 |
| READING3 | 202 | 101 | —I— | —S— | —I— | —I— | 8355 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 4353 | —I— | —I— | —I— | —I— | —I— |
| RECIPE | 3 | 0 | 1 | 1 | 1 | 1 | 2 | 5 | 1 | 1 | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 3 | —I— | 2 | 1 | 1 |
| ROSENBR | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | ( 0) | ( 0) | ( 0) | ( 0) | ( 0) |
| S277-280 | 4 | 4 | 2 | 1 | 1 | 2 | 1 | 5 | 1 | 1 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 |
| S277-280 | 6 | 6 | 2 | 2 | —I— | 18 | 1 | 6 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 2 |
| S277-280 | 8 | 8 | 1 | 1 | —I— | 2 | 2 | 4 | 1 | 1 | 1 | 3 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| S277-280 | 10 | 10 | 2 | 2 | —I— | 1 | 1 | 3 | 1 | 1 | 2 | 3 | 2 | 79 | 2 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| S308 | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 1 | 1 |
| S316-322 | 2 | 1 | 2 | 1 | 2 | 1 | 2 | ( 5) | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 |
| S316-322 | 2 | 1 | 3 | 2 | 3 | 2 | 3 | ( 6) | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 3 | 6 | 3 | 3 | 2 |
| S316-322 | 2 | 1 | ( 3) | ( 2) | ( 3) | ( 2) | ( 3) | 6 | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 3) | ( 2) | ( 2) | ( 3) | ( 7) | ( 3) | ( 3) | ( 2) |
| S316-322 | 2 | 1 | ( 3) | ( 2) | ( 3) | ( 2) | ( 3) | ( 6) | ( 3) | ( 3) | ( 3) | 3 | ( 3) | ( 3) | ( 3) | ( 3) | ( 2) | 2 | ( 3) | ( 9) | ( 3) | ( 3) | ( 2) |
| S316-322 | 2 | 1 | ( 3) | ( 2) | ( 3) | ( 2) | ( 3) | 6 | ( 3) | ( 3) | ( 3) | ( 3) | ( 4) | ( 3) | ( 3) | ( 3) | ( 2) | ( 2) | ( 3) | ( 9) | ( 3) | ( 3) | ( 2) |
| S316-322 | 2 | 1 | ( 3) | ( 2) | ( 3) | ( 2) | ( 3) | 6 | ( 3) | ( 3) | ( 3) | ( 4) | ( 4) | ( 4) | ( 3) | ( 3) | ( 2) | ( 2) | ( 3) | ( 9) | ( 3) | ( 3) | ( 2) |
| S316-322 | 2 | 1 | ( 3) | ( 2) | ( 3) | ( 2) | ( 3) | ( 6) | 3 | ( 3) | ( 3) | ( 4) | ( 4) | ( 3) | ( 3) | ( 3) | ( 2) | ( 2) | 3 | —I— | 3 | 3 | 3 |
| SCHMVETT | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| SCHMVETT | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 1 | 1 | 1 |
| SCHMVETT | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | —S— | 10 | 2 | 5 |
| SCHMVETT | 500 | 0 | 3 | 3 | 4 | 4 | 7 | 8 | 6 | 21 | 4 | 4 | 4 | 4 | 4 | 3 | 4 | 4 | 11 | —E— | 26 | 10 | 46 |
| SCHMVETT | 1000 | 0 | 6 | 6 | 7 | 7 | 13 | 14 | 12 | 75 | 7 | 8 | 8 | 8 | 7 | 7 | 19 | 7 | 35 | —S— | 51 | 20 | 28 |
| SCHMVETT | 5000 | 0 | 30 | 31 | 36 | 36 | 65 | 71 | 58 | 1404 | 36 | 38 | 38 | 38 | 34 | 32 | 53 | 35 | 195 | —T— | 228 | 112 | 268 |
| SCHMVETT | 10000 | 0 | 60 | 61 | 71 | 72 | 132 | 139 | 118 | 5669 | 72 | 76 | 77 | 76 | 69 | 65 | 106 | 71 | 389 | —T— | 548 | 203 | 286 |
| SEMICON1 | 12 | 10 | 10 | —S— | —S— | —S— | —F— | —F— | —S— | —S— | 10 | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —S— | —F— | —S— | —S— | —S— |
| SEMICON1 | 52 | 50 | 66 | 33 | 42 | 31 | —F— | —F— | 57 | 62 | 76 | 114 | 53 | 112 | 88 | —F— | —F— | 58 | —F— | —F— | 70 | 72 | —F— |
| SEMICON1 | 102 | 100 | 166 | 105 | —F— | 73 | —F— | —F— | 189 | 155 | 196 | 153 | 138 | 152 | 228 | —F— | —F— | 114 | —F— | —F— | 137 | 168 | —F— |
| SEMICON1 | 502 | 500 | 492 | 486 | —F— | 1007 | —F— | —F— | —F— | —F— | 624 | 656 | 765 | 645 | —F— | —F— | —F— | 2128 | —F— | —F— | 753 | 621 | —F— |
| SEMICON2 | 12 | 10 | 4 | —S— | 2 | 3 | 26 | 88 | 6 | 4 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 3 | 15 | 21 | 6 | 6 | 5 |
| SEMICON2 | 52 | 50 | 12 | 7 | 11 | 10 | 177 | —F— | 28 | 25 | 14 | 15 | 17 | 15 | 14 | 17 | 11 | 10 | —F— | —F— | 14 | 13 | —F— |
| SEMICON2 | 102 | 100 | 21 | 14 | 19 | 21 | 424 | —F— | 75 | 53 | 25 | 29 | 29 | 28 | 26 | 28 | 19 | 26 | —F— | —F— | 24 | 23 | 23 |
| SEMICON2 | 502 | 500 | 70 | 66 | 82 | 84 | —T— | —F— | —T— | 480 | 93 | 101 | 102 | 100 | 88 | 80 | 70 | 74 | —F— | —F— | 119 | 117 | —F— |
| SEMICON2 | 1002 | 1000 | 150 | 111 | 181 | 189 | —T— | —F— | —T— | 884 | 204 | 220 | 223 | 218 | 191 | 151 | 156 | 166 | —F— | —F— | 251 | 247 | 298 |
| SIMPLLPA | 2 | 2 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| SIMPLLPB | 2 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| SINQUAD | 5 | 0 | 1 | 1 | 1 | 1 | 2 | 3 | 1 | 2 | 1 | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SINQUAD | 50 | 0 | 6 | 5 | 2 | 2 | 4 | 3 | 6 | 6 | 7 | 9 | 2 | 2 | 2 | 7 | 5 | 5 | 9 | 9 | 7 | 7 | 7 |
| SINQUAD | 100 | 0 | 14 | 12 | 3 | 3 | 7 | 5 | 12 | 13 | 20 | 22 | 4 | 4 | 4 | 16 | 14 | 27 | 18 | 16 | 17 | 17 | 17 |
| SINQUAD | 500 | 0 | 88 | 86 | 26 | 26 | 28 | 33 | 79 | 84 | 120 | 137 | 28 | 28 | 72 | 103 | 102 | ( 284) | 102 | 92 | 107 | 105 | 118 |
| SINQUAD | 1000 | 0 | 230 | 226 | 90 | 90 | 77 | 89 | 184 | 195 | 307 | 488 | 92 | 91 | 270 | 214 | 215 | 2638 | 270 | 273 | 273 | 269 | 270 |
| SINQUAD | 5000 | 0 | ( 1495) | ( 1508) | 1949 | 1984 | ( 555) | —I— | 1728 | 1793 | 2807 | 10645 | 2147 | 2142 | 8270 | 1966 | 2011 | —T— | 2191 | 1841 | 2142 | 2157 | 1994 |
| SINQUAD | 10000 | 0 | 4710 | 4727 | 13022 | 11756 | 1709 | —I— | 4216 | 5093 | 5238 | —T— | 13126 | 12405 | —T— | 5439 | 6045 | —T— | 5876 | 5045 | 5882 | 5829 | 6212 |
| SISSER | 2 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| SNAIL | 2 | 0 | 5 | 3 | 3 | 3 | 5 | 5 | 5 | 5 | 5 | 7 | 6 | 5 | 5 | 6 | 2 | 3 | 9 | —I— | 6 | 13 | 17 |
| SPANHYD | 97 | 33 | 16 | 93 | —I— | 29 | 7 | —I— | 18 | 11 | 11 | —I— | 21 | 150 | 18 | 10 | 15 | 14 | 42 | —I— | —I— | 41 | —I— |
| SPMSQRT | 28 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | —I— | 1 | 1 | 2 |
| SPMSQRT | 100 | 0 | 4 | 6 | 4 | 5 | 4 | 5 | 4 | 4 | 4 | 6 | 5 | 5 | 4 | 5 | 3 | 6 | 5 | —I— | 4 | 4 | 13 |
| SPMSQRT | 499 | 0 | 18 | 39 | 20 | 48 | 24 | 33 | 25 | 35 | 21 | 29 | 25 | 24 | 22 | —I— | 18 | 70 | 25 | —S— | 24 | 19 | 70 |
| SPMSQRT | 1000 | 0 | 40 | 90 | 51 | 190 | 56 | 70 | 47 | 66 | 46 | 58 | 48 | 55 | 44 | —I— | 33 | 266 | 48 | —I— | 41 | 39 | 323 |
| SPMSQRT | 4999 | 0 | 200 | —T— | 370 | 12838 | 465 | —T— | 332 | 439 | 227 | 354 | 278 | 307 | 221 | —T— | 216 | 7330 | 528 | —I— | 184 | 233 | 762 |
| SPMSQRT | 10000 | 0 | 457 | —T— | 1063 | —T— | 870 | —T— | 684 | 972 | 516 | 782 | 525 | 844 | 442 | —T— | 519 | —T— | 929 | —T— | 484 | 694 | 3150 |
| SROSENBR | 10 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 2 | 2 | 1 | 1 | 1 |
| SROSENBR | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| SROSENBR | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 3 | 3 | 2 | 2 | 3 |
| SROSENBR | 500 | 0 | 5 | 4 | 2 | 3 | 4 | 4 | 2 | 4 | 7 | 6 | 5 | 5 | 5 | 5 | 3 | 48 | 8 | 8 | 6 | 6 | 8 |
| SROSENBR | 1000 | 0 | 9 | 8 | 4 | 5 | 6 | 6 | 4 | 7 | 13 | 11 | 10 | 9 | 9 | 9 | 5 | 255 | 14 | 14 | 11 | 11 | 13 |
| SROSENBR | 5000 | 0 | 41 | 40 | 22 | 24 | 28 | 29 | 33 | 31 | 61 | 50 | 45 | 44 | 41 | 43 | 26 | 17925 | 68 | 67 | 54 | 54 | 61 |
| SROSENBR | 10000 | 0 | 82 | 82 | 43 | 48 | 55 | 57 | 66 | 74 | 121 | 99 | 89 | 88 | 82 | 86 | 74 | —T— | 172 | 186 | 108 | 107 | 124 |
| SSEBLIN | 194 | 72 | 44 | 44 | —I— | —I— | 29 | —I— | 44 | 57 | 57 | —I— | 42 | —I— | 35 | 43 | 50 | 56 | 44 | 44 | 44 | 44 | 45 |

Cputimes (in seconds) ( 15 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SSEBNLN | 194 | 96 | 44 | 45 | —I— | —I— | 32 | —I— | 44 | 62 | 61 | 78 | 41 | 72 | 39 | 56 | 52 | 78 | 45 | 50 | 49 | 46 | 48 |
| STEENBRA | 432 | 108 | 117 | 123 | —I— | —I— | 34 | —I— | 62 | 72 | 142 | —I— | 229 | —I— | —I— | 113 | 115 | 116 | 120 | 113 | 108 | 119 | —I— |
| STEENBRB | 468 | 108 | —I— | —I— | —I— | 1088 | —I— | ( 1423) | 217 | 130 | 406 | —E— | 154 | —I— | 255 | 136 | —I— | 442 | —I— | —I— | —I— | 983 | —I— |
| STEENBRC | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 669) | —I— | —I— | —I— | —E— | ( 414) | —I— | 762 | —I— | —I— | 820 | —I— | —I— | —I— | 1592 | —I— |
| STEENBRD | 468 | 108 | —I— | 1185 | —I— | —I— | —I— | ( 1437) | ( 125) | —I— | —I— | —E— | ( 215) | —E— | 566 | —I— | —I— | ( 532) | —I— | —I— | ( 1043) | ( 835) | —I— |
| STEENBRE | 540 | 126 | 1367 | —I— | —I— | —I— | —I— | ( 1750) | —I— | —I— | —I— | —I— | 314 | —E— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | 1728 | —I— |
| STEENBRF | 468 | 108 | —I— | —I— | —I— | 1788 | —I— | ( 923) | 68 | 120 | —I— | —E— | 200 | ( 576) | 154 | 540 | —I— | 223 | —I— | —I— | 847 | 945 | —I— |
| STEENBRG | 540 | 126 | —I— | —I— | —I— | —I— | —I— | ( 1621) | —I— | —I— | —I— | —E— | 326 | —E— | 1014 | —I— | —I— | 895 | —I— | —I— | —I— | ( 1778) | —I— |
| SVANBERG | 10 | 10 | 8 | 6 | —I— | 6 | 6 | 6 | 5 | 7 | 6 | 11 | 11 | 8 | 6 | 8 | 13 | 8 | 8 | 15 | 9 | 8 | 8 |
| SVANBERG | 20 | 20 | 13 | 12 | 25 | 14 | 15 | 12 | 13 | 12 | 15 | 16 | 23 | 16 | 16 | 13 | 14 | 18 | 14 | 28 | 14 | 14 | 13 |
| SVANBERG | 30 | 30 | 25 | 23 | 86 | 27 | 33 | 23 | 18 | 24 | 20 | 22 | 53 | 33 | 32 | 20 | 39 | 36 | 28 | 63 | 28 | 27 | 23 |
| SVANBERG | 40 | 40 | 37 | 35 | 58 | 50 | 60 | 36 | 23 | 34 | 31 | 34 | 57 | 39 | 40 | 23 | 50 | 62 | 31 | 84 | 32 | 31 | 33 |
| SVANBERG | 50 | 50 | 41 | 40 | —I— | 75 | 85 | 51 | 28 | 49 | 45 | 57 | 79 | 63 | 50 | 44 | 54 | 84 | 50 | 148 | 47 | 46 | 43 |
| SVANBERG | 60 | 60 | 51 | 49 | 478 | 108 | 109 | 69 | 35 | 65 | 49 | 58 | 130 | 58 | 62 | 49 | 41 | 117 | 47 | 186 | 49 | 47 | 44 |
| SVANBERG | 70 | 70 | 61 | 59 | 207 | 142 | 158 | 86 | 52 | 102 | 65 | 80 | 138 | 102 | 61 | 44 | 86 | 150 | 76 | 254 | 70 | 72 | 74 |
| SVANBERG | 80 | 80 | 75 | 73 | 507 | 200 | 219 | 110 | 55 | 116 | 95 | 77 | 127 | 95 | 70 | 84 | 77 | 207 | 64 | 295 | 70 | 67 | 71 |
| SVANBERG | 90 | 90 | 83 | 82 | 271 | 237 | 307 | 134 | 65 | 220 | 97 | 91 | 163 | 128 | 88 | 84 | 130 | 236 | 79 | 338 | 87 | 82 | 79 |
| SVANBERG | 100 | 100 | 128 | 126 | 1059 | 295 | 400 | 182 | 97 | 240 | 131 | 110 | 187 | 128 | 98 | 116 | 123 | 264 | 106 | 391 | 109 | 109 | 111 |
| SVANBERG | 500 | 500 | 1116 | 1118 | —I— | —T— | 4814 | 2434 | 899 | 6435 | 1347 | 854 | 1872 | 1813 | 948 | 1315 | 1111 | 4861 | 1261 | 4514 | 1308 | 1249 | 1281 |
| SVANBERG | 1000 | 1000 | 3671 | 3658 | —I— | —T— | —T— | 8228 | 3223 | —T— | 4227 | 2450 | 6102 | 4698 | 2856 | 2400 | 2825 | 17164 | 4040 | 10934 | 3998 | 3545 | 4334 |
| SVANBERG | 5000 | 5000 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |
| TAME | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TENBARS1 | 18 | 9 | 112 | 64 | —I— | —I— | 64 | —I— | —S— | 57 | —S— | 135 | —I— | 42 | 75 | —S— | 53 | —S— | —I— | —I— | 50 | —S— | —I— |
| TENBARS2 | 18 | 8 | 46 | 58 | —I— | —I— | 34 | —I— | 66 | 40 | 60 | 47 | —I— | 48 | 80 | —S— | 32 | 50 | 76 | —I— | 46 | 39 | —I— |
| TENBARS3 | 18 | 8 | 29 | 46 | —I— | —I— | 22 | —I— | 52 | 27 | 49 | 37 | —I— | 44 | 76 | 23 | 24 | 61 | 55 | —I— | 29 | 30 | —I— |
| TENBARS4 | 18 | 9 | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —S— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— | —I— |
| TOINTGOR | 50 | 0 | 2 | 2 | 1 | 2 | 2 | 7 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | ( 1) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | ( 1) | 0 | 0 | 0 | 0 | 0 | 0 |
| TOINTGSS | 50 | 0 | 0 | 0 | 0 | 0 | ( 1) | 1 | ( 1) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | ( 1) | 0 | 0 | 0 | 0 | 0 | 1 |
| TOINTGSS | 100 | 0 | 0 | 0 | 0 | 0 | ( 1) | ( 2) | ( 2) | 0 | 0 | 0 | 0 | 0 | 0 | ( 1) | ( 2) | 0 | 0 | 1 | 0 | 0 | 1 |
| TOINTGSS | 500 | 0 | 2 | 1 | 1 | 1 | ( 3) | ( 5) | ( 3) | 1 | 2 | 1 | 2 | 1 | 1 | 7 | ( 6) | 2 | 2 | 2 | 2 | 2 | 2 |
| TOINTGSS | 1000 | 0 | 3 | 2 | 3 | 3 | ( 5) | ( 8) | ( 6) | 2 | 3 | 3 | 3 | 3 | 3 | 14 | ( 10) | 3 | 3 | 2 | 3 | 3 | 4 |
| TOINTGSS | 5000 | 0 | 14 | 12 | 12 | 13 | ( 28) | ( 43) | ( 24) | 12 | 15 | 14 | 14 | 13 | 14 | 68 | ( 60) | 14 | 15 | 11 | 15 | 14 | 19 |
| TOINTGSS | 10000 | 0 | 27 | 24 | 25 | 26 | 56 | ( 89) | ( 48) | 25 | 31 | 26 | 28 | 26 | 28 | 86 | 111 | 28 | 29 | 23 | 29 | 29 | 37 |
| TOINTPSP | 50 | 0 | 3 | 2 | 2 | 4 | 4 | 4 | 4 | 3 | 3 | 5 | 4 | 4 | 3 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |
| TOINTQOR | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| TORSIONA | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| TORSIONA | 100 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 8 | 1 | 1 | 2 |
| TORSIONA | 484 | 0 | 7 | 9 | 4 | 4 | 7 | 8 | 8 | 7 | 8 | 4 | 4 | 4 | 5 | 8 | 8 | 8 | 10 | 206 | 10 | 10 | 14 |
| TORSIONA | 1024 | 0 | 27 | 30 | 12 | 13 | 30 | 29 | 29 | 24 | 29 | 14 | 14 | 14 | 16 | 28 | 29 | 28 | 34 | 1451 | 34 | 33 | 36 |
| TORSIONA | 5476 | 0 | 620 | 491 | 202 | 214 | 737 | 662 | 666 | 548 | 706 | 226 | 237 | 227 | 250 | 619 | 558 | 483 | 497 | —I— | 499 | 484 | 677 |
| TORSIONA | 10000 | 0 | 1879 | 1266 | 541 | 576 | 2334 | 2073 | 2133 | 1686 | 2145 | 605 | 645 | 604 | 695 | 1882 | 1670 | 1513 | 1462 | —I— | 1464 | 1448 | 1823 |
| TORSIONA | 14884 | 0 | 4009 | 3745 | 1022 | 1092 | 5021 | 4400 | 4479 | 3600 | 4610 | 1136 | 1224 | 1136 | 1432 | 4055 | 3637 | 3007 | 2402 | —T— | 2408 | 2388 | 2618 |
| TORSIONB | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 |
| TORSIONB | 100 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 7 | 1 | 1 | 2 |
| TORSIONB | 484 | 0 | 12 | 14 | 10 | 6 | 7 | 9 | 9 | 10 | 14 | 8 | 8 | 8 | 10 | 15 | 24 | 12 | 10 | 163 | 10 | 10 | 12 |
| TORSIONB | 1024 | 0 | 39 | 45 | 49 | 25 | 28 | 25 | 30 | 31 | 49 | 40 | 40 | 40 | 41 | 74 | 114 | 38 | 41 | 790 | 41 | 40 | 45 |
| TORSIONB | 5476 | 0 | 1054 | 1143 | 2294 | 997 | 754 | 575 | 770 | 827 | 1347 | 1374 | 1396 | 1376 | 1010 | 2829 | 3381 | 1025 | 695 | —I— | 695 | 692 | 735 |
| TORSIONB | 10000 | 0 | 3713 | 3640 | 8281 | 4121 | 2501 | 1660 | 2538 | 2916 | 4714 | 4628 | 4684 | 5340 | 2916 | 9571 | 11668 | 3701 | 2231 | —I— | 2255 | 2462 | 2368 |
| TORSIONB | 14884 | 0 | 8652 | 8900 | —T— | —I— | 6084 | 4258 | 6359 | 6816 | 11024 | 11407 | 11400 | 11508 | —T— | —T— | —T— | 8408 | 4843 | —T— | 4846 | 4840 | 5139 |
| TORSIONC | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONC | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |
| TORSIONC | 484 | 0 | 3 | 4 | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 7 | 40 | 7 | 7 | 7 |
| TORSIONC | 1024 | 0 | 8 | 11 | 4 | 5 | 8 | 9 | 9 | 8 | 8 | 5 | 5 | 5 | 6 | 9 | 8 | 9 | 15 | 165 | 15 | 15 | 18 |
| TORSIONC | 5476 | 0 | 156 | 157 | 63 | 64 | 186 | 181 | 176 | 146 | 165 | 70 | 73 | 70 | 77 | 158 | 135 | 149 | 319 | —I— | 288 | 291 | 325 |
| TORSIONC | 10000 | 0 | 473 | 489 | 169 | 167 | 584 | 551 | 542 | 445 | 510 | 183 | 188 | 183 | 210 | 482 | 400 | 401 | 467 | —I— | 417 | 416 | 490 |
| TORSIONC | 14884 | 0 | 987 | 1101 | 321 | 326 | 1248 | 1162 | 1150 | 929 | 1075 | 356 | 368 | 363 | 417 | 997 | 810 | 813 | 1596 | —I— | 1507 | 1507 | 1630 |
| TORSIOND | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIOND | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 1 | 1 | 1 |

Cputimes (in seconds) ( 16 )

| Problem | $n$ | $m$ | default | scaling | mltf | semltf | noprc | diagonal | band(0) | band(1) | band(10) | expband | seprc | gmpsprc | munksg | appGCP | l2norm | accBQP | bfgs | dfp | psb | sr1 | fdg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TORSIOND | 484 | 0 | 4 | 5 | 3 | 2 | 3 | 4 | 4 | 3 | 3 | 2 | 2 | 3 | 4 | 16 | 35 | 4 | 4 | 39 | 4 | 4 | 5 |
| TORSIOND | 1024 | 0 | 12 | 13 | 11 | 6 | 11 | 12 | 12 | 11 | 12 | 8 | 8 | 8 | 11 | 85 | 203 | 12 | 15 | 259 | 15 | 15 | 18 |
| TORSIOND | 5476 | 0 | 214 | 232 | 225 | 81 | 233 | 187 | 217 | 196 | 242 | 122 | 125 | 128 | 175 | 4695 | 6085 | 191 | 336 | —I— | 335 | 335 | 362 |
| TORSIOND | 10000 | 0 | 671 | 643 | 1054 | 225 | 738 | 527 | 687 | 623 | 751 | 422 | 427 | 422 | 495 | 16349 | —T— | 599 | 573 | —I— | 573 | 572 | 646 |
| TORSIOND | 14884 | 0 | 1658 | 1481 | 2537 | 609 | 1602 | 1070 | 1477 | 1492 | 1846 | 1165 | 1175 | 1196 | 1227 | —T— | —T— | 1470 | 1227 | —I— | 1229 | 1222 | 1359 |
| TORSIONE | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONE | 484 | 0 | 1 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 7 | 2 | 2 | 3 |
| TORSIONE | 1024 | 0 | 4 | 6 | 3 | 3 | 4 | 5 | 4 | 4 | 3 | 3 | 3 | 3 | 4 | 5 | 5 | 5 | 6 | 89 | 6 | 6 | 8 |
| TORSIONE | 5476 | 0 | 56 | 61 | 29 | 31 | 63 | 67 | 62 | 55 | 55 | 33 | 33 | 33 | 32 | 59 | 59 | 55 | 79 | 1334 | 78 | 78 | 86 |
| TORSIONE | 10000 | 0 | 150 | 138 | 71 | 70 | 175 | 182 | 171 | 146 | 149 | 78 | 79 | 93 | 76 | 158 | 151 | 160 | 171 | 6939 | 172 | 170 | 215 |
| TORSIONE | 14884 | 0 | 276 | 260 | 115 | 116 | 340 | 342 | 325 | 268 | 282 | 131 | 132 | 145 | 140 | 287 | 277 | 287 | 1030 | —I— | 1067 | 1025 | 1173 |
| TORSIONF | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONF | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TORSIONF | 484 | 0 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 5 | 6 | 2 | 2 | 7 | 2 | 2 | 3 |
| TORSIONF | 1024 | 0 | 5 | 7 | 4 | 4 | 5 | 6 | 6 | 5 | 4 | 4 | 4 | 4 | 5 | 49 | 108 | 7 | 6 | 81 | 7 | 6 | 9 |
| TORSIONF | 5476 | 0 | 65 | 69 | 57 | 33 | 76 | 69 | 73 | 63 | 67 | 39 | 39 | 39 | 54 | 2942 | 5854 | 63 | 87 | 2642 | 88 | 85 | 105 |
| TORSIONF | 10000 | 0 | 197 | 200 | 121 | 77 | 220 | 175 | 200 | 190 | 208 | 109 | 109 | 111 | 133 | 11697 | 6126 | 180 | 188 | 7399 | 190 | 188 | 227 |
| TORSIONF | 14884 | 0 | 372 | 410 | 394 | 125 | 428 | 328 | 395 | 367 | 389 | 240 | 238 | 236 | 292 | —T— | —T— | 336 | 389 | —I— | 382 | 380 | 445 |
| TQUARTIC | 5 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| TQUARTIC | 10 | 0 | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| TQUARTIC | 50 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 3 | 3 | 0 | 0 | 0 | 3 | 1 | 1 | 2 | 1 | 2 | 1 | 2 |
| TQUARTIC | 100 | 0 | 3 | 2 | 2 | 4 | 2 | 2 | 0 | 2 | 4 | 4 | 0 | 0 | 0 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 3 |
| TQUARTIC | 500 | 0 | 10 | 9 | 14 | 216 | 5 | 14 | 1 | 6 | 11 | 2 | 2 | 2 | 2 | 10 | 10 | 6 | 10 | 10 | 10 | 10 | 11 |
| TQUARTIC | 1000 | 0 | 16 | 16 | 40 | 1035 | 11 | 37 | 3 | 18 | 26 | 4 | 7 | 6 | 6 | 17 | 16 | 12 | 17 | 17 | 17 | 17 | 20 |
| TQUARTIC | 5000 | 0 | 148 | 147 | 670 | —T— | 79 | 418 | 50 | 98 | 182 | 62 | 121 | 121 | 110 | 151 | 207 | 141 | 150 | 142 | 150 | 148 | 174 |
| TQUARTIC | 10000 | 0 | 358 | 358 | 2327 | —T— | 243 | 1218 | 186 | 302 | 525 | 220 | 478 | 478 | 425 | 363 | 930 | 369 | 368 | 398 | 368 | 365 | 422 |
| TRIDIA | 10 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRIDIA | 20 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRIDIA | 30 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRIDIA | 50 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRIDIA | 100 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| TRIDIA | 500 | 0 | 1 | 1 | 1 | 1 | 4 | 29 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| TRIDIA | 1000 | 0 | 3 | 1 | 2 | 2 | 9 | 88 | 5 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 3 | 3 | 3 | 3 | 3 | 3 |
| TRIDIA | 5000 | 0 | 11 | 7 | 11 | 11 | 44 | 797 | 25 | 10 | 13 | 13 | 13 | 12 | 23 | 13 | 21 | 15 | 11 | 11 | 11 | 11 | 13 |
| TRIDIA | 10000 | 0 | 22 | 13 | 22 | 22 | 88 | 2143 | 49 | 20 | 26 | 26 | 25 | 24 | 24 | 25 | 43 | 30 | 21 | 21 | 22 | 22 | 24 |
| TRIGGER | 7 | 6 | 2 | —F— | 2 | 2 | —S— | —I— | —I— | —I— | 2 | 3 | 2 | 3 | 4 | 2 | —S— | 1 | 2 | 1 | 2 | 2 | 2 |
| VARDIM | 10 | 0 | 1 | 1 | 1 | 1 | 1 | 27 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 1 | 1 |
| VARDIM | 50 | 0 | 3 | 4 | 2 | 2 | 2 | —I— | 3 | 3 | 3 | 8 | 11 | 11 | 11 | 3 | 2 | 2 | 3 | 3 | 3 | 3 | 2 |
| VARDIM | 100 | 0 | 6 | 10 | 3 | 3 | 3 | —I— | 5 | 5 | 6 | 35 | 64 | 61 | 63 | 6 | 5 | 5 | 6 | 6 | 6 | 6 | 5 |
| VAREIGVL | 10 | 0 | 2 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 2 | 2 | 4 | 2 | 1 | 2 | 1 | 1 | 2 | 1 | 2 | 2 | 2 |
| VAREIGVL | 50 | 0 | 3 | 3 | 6 | 6 | 2 | 5 | 3 | 3 | 3 | 6 | 6 | 6 | 6 | 3 | 2 | 2 | 2 | 1 | 3 | 3 | 3 |
| VAREIGVL | 100 | 0 | 4 | 4 | 23 | 25 | 3 | 6 | 4 | 4 | 4 | 20 | 25 | 24 | 26 | 4 | 5 | 4 | 4 | —I— | 4 | 5 | 9 |
| VAREIGVL | 500 | 0 | 24 | 29 | 1823 | 1949 | 13 | 33 | 23 | 23 | 25 | 1507 | 2078 | 1993 | 2032 | 24 | 25 | 24 | 33 | —I— | 23 | 23 | 44 |
| VAREIGVL | 1000 | 0 | 71 | 83 | 15363 | 15887 | 30 | 112 | 66 | 66 | 71 | 11413 | 15904 | 15295 | 15416 | 72 | 71 | 77 | 91 | —I— | 72 | 74 | 99 |
| VAREIGVL | 5000 | 0 | 1324 | 1452 | —M— | —M— | 167 | 3243 | 1306 | 1313 | 1336 | —M— | —M— | —M— | —M— | 1351 | 1429 | 1330 | 1242 | —T— | 1277 | 1254 | 2254 |
| WATSON | 12 | 0 | 3 | 5 | —I— | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 9 | 3 | 3 | 3 | 3 | 4 | 65 | 65 | 8 | 7 | 10 |
| WATSON | 31 | 0 | 6 | 422 | —I— | 91 | 4 | 118 | 5 | 6 | 6 | 23 | 12 | 59 | 11 | 6 | 6 | 8 | 10 | 10 | 9 | 10 | 14 |
| WOODS | 4 | 0 | 2 | 2 | 2 | 1 | 2 | 26 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| WOODS | 100 | 0 | 4 | 5 | 5 | 4 | 4 | 40 | 3 | 4 | 4 | 4 | 4 | 5 | 4 | 4 | 3 | 4 | 2 | 2 | 4 | 4 | 3 |
| WOODS | 1000 | 0 | 23 | 30 | 30 | 441 | 18 | 181 | 18 | 17 | 32 | 28 | 28 | 28 | 24 | 25 | 18 | 201 | 12 | 12 | 23 | 23 | 24 |
| WOODS | 10000 | 0 | 216 | 254 | 241 | —T— | 166 | 1676 | 179 | 166 | 308 | 260 | 264 | 262 | 231 | 199 | 205 | —T— | 130 | 131 | 223 | 221 | 232 |
| ZANGWIL2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ZANGWIL3 | 3 | 0 | 1 | 0 | 1 | 0 | 1 | 22 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 0 |
| ZIGZAG | 64 | 50 | 13 | 12 | —I— | 34 | 7 | 11 | 10 | 10 | 14 | 9 | 10 | 8 | 10 | 15 | 15 | 17 | 14 | 18 | 14 | 18 | 16 |
| ZIGZAG | 304 | 250 | 864 | 1496 | —I— | —I— | 3225 | 794 | 632 | 719 | 732 | 277 | 185 | —I— | 174 | 871 | 929 | 933 | 1572 | 1718 | 945 | 891 | 917 |
| ZIGZAG | 604 | 500 | 3318 | —I— | —I— | —I— | —T— | 8047 | 3635 | 5438 | 1726 | 657 | 663 | —I— | 656 | 3465 | 3566 | 3603 | —S— | —S— | 3336 | 3204 | 3327 |
| ZIGZAG | 3004 | 2500 | —T— | —T— | —T— | —T— | —T— | —I— | —T— | —T— | 11883 | —T— | 9936 | —T— | 10194 | —T— | —T— | —T— | —T— | —T— | —T— | —T— | —T— |

## References


[1] I. Bongartz, A. R. Conn, N. I. M. Gould, and Ph. L. Toint. CUTE: a collection of constrained and unconstrained test examples for nonlinear programming. Technical Report (in preparation), Department of Mathematics, FUNDP, Namur, Belgium, 1992.

[2] A. R. Conn, N. I. M. Gould, and Ph. L. Toint. LANCELOT*: a Fortran package for large-scale nonlinear optimization (Release A)*. Number 17 in Springer Series in Computational Mathematics. Springer Verlag, Heidelberg, Berlin, New York, 1992.

[3] A. R. Conn, N. I. M. Gould, and Ph. L. Toint. Numerical experiments with the LANCELOT package (Release A) for large-scale nonlinear optimization. Technical Report 92/16, Department of Mathematics, FUNDP, Namur, Belgium, 1992.