

Complete results from a numerical evaluation of HSL packages for the direct-solution of large, sparse, symmetric linear systems of equations

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ABSTRACT

In recent years a number of new direct solvers for the solution of large sparse, symmetric linear systems of equations have been added to the mathematical software library HSL. In this report, we give full details of all of the numerical results obtained during an extensive comparison of these solvers. Details of the solvers themselves, of the comparison methodology used, and of conclusions drawn are given in an accompanying summary paper (Gould and Scott, 2003).

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1 Introduction

The solution of linear systems of equations $Ax = b$ (or systems with multiple right-hand sides $AX = B$) is one of the cornerstones of scientific computation. In many cases, particularly when discretizing continuous problems, the system is large and the associated matrix A sparse. More importantly, for many applications, the matrix is symmetric; sometimes, such as in finite-element applications, A is positive definite, while in other cases, for example for constrained optimization, it may be indefinite.

HSL 2002 is an ISO Fortran library of packages for many areas in scientific computation (HSL, 2002). It is probably best known for its codes for the direct solution of linear systems, there being a number of different packages for both the symmetric and unsymmetric cases. Since a potential user may be bewildered by such choice, our intention in this paper is to compare the different alternatives on a significant set of large test examples from many different application areas, and, as far as is possible, to make recommendations as to the efficacy of the various packages. We have chosen to concentrate on systems with symmetric A since there has recently been a thorough comparison of codes for the unsymmetric case by Gupta (2002). This study forms part of a wider on-going comparison of both HSL and non-HSL codes for the direct solution of symmetric linear systems, which will be reported on shortly.

For ease of reference, all the HSL codes that are used in this study are listed with a very brief description in Table 1.1. More details are given in Gould and Scott (2003). The interested reader is also referred to the webpage www.cse.clrc.ac.uk/nag/hsl/contents.shtml; a complete catalogue for HSL is available from this site.

Code	Description
MA27	Sparse symmetric linear solver.
MA47	Multifrontal algorithm. Minimum degree ordering.
MA55	Sparse symmetric indefinite linear solver.
MA57	Variable band symmetric positive-definite linear solver.
MA62	Sparse symmetric linear solver.
MA67	Multifrontal algorithm. Approximate minimum degree ordering.
MA62	Sparse symmetric positive-definite linear solver for equations in elemental form.
MA67	(Uni)frontal algorithm.
FA14	Sparse symmetric indefinite linear solver.
MC30	Generators pseudo-random numbers.
MC37	Matrix scaling routine.
MC50	Given a symmetric sparse matrix, computes a set of element matrices that, if assembled, would yield the same matrix.
MC60	Produces an approximate minimum degree ordering of a symmetric matrix, taking precautions against possibly dense columns (currently a private subroutine within MA57).
MC63	Orders a matrix with symmetric sparsity pattern for small bandwidth or profile (used by MA55).
MC73	Orders elements for a frontal solver (used by MA62).
MC73	Computes spectral ordering (used by MA62).

Table 1.1: HSL codes used in our numerical experiments.

2 Positive definite matrices

2.1 Test matrices

Our aim in this study is to test the solvers on as wide a range of test problems from as many different application areas as possible. In collecting test data we imposed only two conditions:

- The matrix must be of order greater than 10,000.
- The data must be available to other users.

The first condition was imposed because our interest is in large problems. The second condition was to ensure that our tests could be repeated by other users and, furthermore, it enables other software developers to test their codes on the same set of examples and thus to make comparisons with HSL solvers. Provided the above conditions are satisfied, we have included all relevant real symmetric matrices of order exceeding 10,000 from Matrix Market (MM) (math.nist.gov/MatrixMarket/), the Harwell-Boeing (HB) and Rutherford-Boeing (RB) Collections (Duff, Grimes and Lewis, 1989 and 1997), the PARASOL (PA) project (www.parallab.uib.no/parasol/data.html), the University of Florida (UF) Sparse Matrix Collection (www.cise.ufl.edu/~davis/sparse/) and those given by Kumfert and Pothen (1997) (KP), as well as representative matrices derived from the CUTE/CUTEr optimization test set (Bongartz, Conn, Gould and Toint, 1995, and Gould, Orban and Toint, 2002). In addition Christian Damhaug (Det Norske Veritas AS) (CD) provided a number of unassembled finite-element examples, whilst Anshul Gupta (IBM, T. J. Watson) (AG), Alison Ramage (U. Strathclyde) (AR), and Andy Wathen (Oxford U.) (AW) provided the problems bearing their names. Application areas represented by our test set include linear programming, nonlinear optimization, structural engineering, computational fluid dynamics, acoustics, and financial modelling. The test set currently comprises 88 positive-definite problems.

In Table 2.1.1, we give characteristics of all of the positive-definite matrices used in our tests. Here n and nnz give the order and number of nonzeros respectively. In keeping with our accompanying paper (Gould and Scott, 2003), we also indicate those belonging to the “large” *subset*, namely those whose order is $\geq 50,000$.

Some matrices are only available as a sparsity pattern, and for these cases appropriate numerical values have been generated. Reproducible pseudo-random off-diagonal entries in the range $(0, 1)$ are generated using FA14, while the i -th diagonal entry, $1 \leq i \leq n$, is set to $\max(100, 10\rho_i)$, where ρ_i is the number of off-diagonal entries in row i of the matrix, thus ensuring that the generated matrix is numerically positive definite. The right-hand side for each problem is generated so that the required solution is the vector of ones.

The matrices are stored in a variety of formats, as indicated by the suffix attached to the problem name in Table 2.1.1. Matrices in Harwell-Boeing (HB) format are flagged by a suffix .PSA, .PSE, .RSA or .RSE, where the initial P or R indicates whether simply the pattern is provided or if values are available, while the final A or E is used to distinguish between assembled and unassembled-finite-element problems. Lower-case equivalents .psa, .pse, .rsa or .rse indicate matrices in Rutherford-Boeing (RB) format in the obvious way. Those matrices supplied by Kumfert and Pothen (1997) are held as adjacency structures of their graphs, and are indicated by the suffix .kp. All other matrices are flagged by .mat and are stored in coordinate form.

The matrices are available from

`ftp://ftp.numerical.rl.ac.uk/pub/matrices/symmetric/`

in the subdirectory `psdef`, while a representative code showing how the matrices may be read for use by MA57 is in the subdirectory `codes`.

Table 2.1.1: Positive definite test matrices and their characteristics

Name	n	nnz	Subset?	Application
3dtube.PSA	45330	1629474		3-D pressure tube (UF)
audikw_1.rsa	943695	39297771	✓	Automotive crankshaft model (PA)
barth5.kp	15606	61484		Nasa matrix (KP)
bcsstk25.RSA	15439	133840		Stiffness matrix—76 story skyscraper (HB)
bcsstk29.PSA	13992	316740		Stiffness matrix—rear pressure bulkhead (HB)
bcsstk30.PSA	28924	1036208		Stiffness matrix—off-shore generator platform (HB)
bcsstk31.PSA	35588	608502		Stiffness matrix—automobile component (HB)
bcsstk32.PSA	44609	1029655		Stiffness matrix—automobile chassis (HB)
bcsstk36.RSA	23052	583096		Stiffness matrix—automobile shock absorber (HB)
bmw7st_1.rsa	141347	3740507	✓	Linear static analysis—car body (PA)
bmwcra_1.rsa	148770	5396386	✓	Automotive crankshaft model (PA)
bodyy4.RSA	17546	69742		NASA matrix (UF)
bodyy5.RSA	18589	73935		NASA matrix (UF)
bodyy6.RSA	19366	77057		NASA matrix (UF)
cf1.RSA	70656	949510	✓	CFD pressure matrix (UF)
cf2.RSA	123440	1605669	✓	CFD pressure matrix (UF)
copter1.kp	17222	114143		helicopter rota blade (KP)
copter2.kp	55476	407714	✓	helicopter rota blade (KP)
crankseg_1.rsa	52804	5333507	✓	Linear static analysis—crankshaft detail (PA)
crankseg_2.rsa	63838	7106348	✓	Linear static analysis—crankshaft detail (PA)
crplat2.PSE	18010	489478		Corrugated plate field (CD)
ct20stif.PSA	52329	1375396	✓	Stiffness matrix—engine block (UF)
CVXBQP1.rsa	50000	249984	✓	Barrier Hessian from convex QP (CUTer)
Fcondp2.PSE	201822	5748069	✓	Oil production platform (CD)
finan512.RSA	74752	335872	✓	Portfolio optimization (UF)
finance256.kp	37376	167936		Linear programming (KP)
ford1.kp	18728	60152		Car surface mesh (KP)
ford2.kp	100196	322442	✓	Car surface mesh (KP)
Fullb.PSE	199187	5953632	✓	Full-breadth barge (CD)
gearbox.PSA	153746	4617075	✓	Aircraft flap actuator (UF)
GRIDGENA.rsa	48962	329485		Grid generation optimization (CUTer)
gupta1.PSA	31802	1098006		Normal matrix from LP (AG)
gupta2.PSA	62064	2155175	✓	Normal matrix from LP (AG)
gupta3.PSA	16783	4670105		Normal matrix from LP (AG)
Halfb.PSE	224617	6306219	✓	Half-breadth barge (CD)
hood.rsa	220542	5494489	✓	Car hood (PA)
inline_1.rsa	503712	18660027	✓	Inline skater (PA)
JNLBRNG1.rsa	40000	159600		Quadratic journal bearing problem (CUTer)
ldoor.rsa	952203	23737339	✓	Large door (PA)
MINSURFO.rsa	40806	163018		Minimum surface problem (CUTer)
msc10848.RSA	10848	620313		matrix from MSC/NASTRAN (UF)
msc23052.RSA	23052	588933		matrix from MSC/NASTRAN (UF)
M_T1.rsa	97578	4925574	✓	Tubular joint (PA)
nasasrb.RSA	54870	1366097	✓	Shuttle rocket booster (UF)
OBSTCLAE.rsa	40000	158800		Quadratic obstacle problem (CUTer)
OILPAN.rsa	73752	1835470	✓	Car olipan (PA)
onera_dual.kp	85567	252384	✓	NASA matrix (KP)
opt1.PSE	15449	973052		Part of condeep cylinder (CD)

Table 2.1.1: Positive definite test matrices and their characteristics (continued)

Name	n	nnz	Subset?	Application
pds10.kp	16558	83108		Linear programming (KP)
pkustk01.PSA	22044	500712		Beijing botanical exhibition hall (UF)
pkustk02.PSA	10800	410400		Feiyue twin tower building (UF)
pkustk03.PSA	63336	1596876	✓	Dalian group silo (UF)
pkustk04.PSA	55590	2137125	✓	Yunsan Plaza (UF)
pkustk05.PSA	37164	1121154		Cofferdam (reduced model) (UF)
pkustk06.PSA	43164	1307466		Cofferdam (reduced model) (UF)
pkustk07.PSA	16860	1217832		Cubic 21 nodes solid, 10x10x10 mesh (UF)
pkustk08.PSA	22209	1624440		Cubic 21 nodes solid, 11x11x11 mes (UF)
pkustk09.PSA	33960	808800		Group silo (UF)
pkustk10.PSA	80676	2194830	✓	4 tower silo (UF)
pkustk11.PSA	87804	2652858	✓	Cofferdam (full size) (UF)
pkustk12.PSA	94653	3803485	✓	Jijian Plaza, tall building (UF)
pkustk13.PSA	94893	3355860	✓	Machine element, 21 nodes solid (UF)
pkustk14.PSA	151926	7494215	✓	Tall building (UF)
pwt.RSA	36519	181313		NASA matrix (UF)
pwtk.RSA	217918	5926171	✓	Stiffness matrix—pressurized wind tunnel (UF)
ramage02.PSE	16830	1441591		Navier-Stokes & continuity FE equations (AR)
s3dkq4m2.rsa	90449	2455670	✓	Cylindrical Shell (UF)
s3dkt3m2.rsa	90449	1921955	✓	Cylindrical Shell (UF)
SHIPSEC1.rsa	140874	3977139	✓	Ship section (PA)
SHIPSEC5.rsa	179860	5146478	✓	Ship section (PA)
SHIPSEC8.rsa	114919	3384159	✓	Ship section (PA)
SHIP_001.rse	34920	2339575		Ship structure—predesign (PA)
SHIP_003.rsa	121728	4103881	✓	Ship structure—production (PA)
shuttle_eddy.PSA	10429	57014		NASA matrix (UF)
skirt.PSA	12598	104559		NASA matrix (UF)
Srb1.PSE	54924	1508538	✓	Shuttle rocket booster (CD)
struct3.PSA	53570	613632	✓	FE matrix (UF)
tandem_dual.kp	94069	277281	✓	NASA matrix (KP)
tandem_vtx.kp	18454	135902		NASA matrix (KP)
THREAD.rsa	29736	2249892		Threaded connector/contact problem (PA)
TORSION1.rsa	40000	158800		Elastic torsion problem (CUTer)
trdheim.PSE	22098	978711		Mesh of the Trondheim Fjord (CD)
Troll.PSE	213453	6099282	✓	Structural analysis (CD)
tsyl201.PSE	20685	1237821		part of condeep cylinder (CD)
vanbody.rsa	47072	1191985		Van body model (PA)
wathen100.mat	30401	251001		Stokes problem (AW)
wathen120.mat	36441	301101		Stokes problem (AW)
X104.rsa	108384	5138004	✓	Beam joint (PA)

2.2 Individual package comparisons

In this section, we report statistics when running¹ the solvers listed in Table 1.1 on the positive-definite test set described in Section 2.1. All experiments were performed on a single EV6 processor of a Compaq DS20 Alpha server, with 3.6 GBytes of RAM. Each code was compiled

¹By a run, we mean the application of a package to one problem.

with full optimization, and vendor-tuned BLAS were used. Default values were used for all controlling parameters, except that numerical pivoting was disabled and that, following preliminary experiments to find a suitable value, the blocksize for high-level BLAS was set to 16. A CPU limit of 2 hours was set on each run, and any run exceeding this limit was deemed to have failed.

Here (and later) we report the return code from each run, the total CPU time required (as well as separate times for the analyse, factorization and solution phases), the minimum memory that would be required for a successful run along with that actually used, counts of the sizes of integer and real arrays needed to solve the problem (as well as separate counts for those required to hold the factors), and the norms of the scaled residuals $\|b - Ax\|/(\|A\| + \|b\|)$ both following the solution phase and following a single iterative refinement. Note that the analysis and factorization phases for MA67 occur together, so no data is provided for the MA67 analysis phase. In addition, MA27, MA47 and MA55 do not provide statistics on the minimum memory required to solve the problem.

For all codes except MA62, we assemble problems presented in finite-element format. Assembled problems are split into appropriate elements by MC37 prior to solution by MA62. Both MA55 and MA62 rely on the user preordering the problem; we use MC60, MC63 and MC73 for this purpose, and the time taken to do this is included in the analyse time (for more details, see Gould and Scott, 2003).

A return code of 0 indicates a successful run. Other values are

- 99. The CPU limit was reached;
- 22. An allocation error occurred in an auxiliary routine—too much storage was required;
- 2. An allocation error occurred —too much storage was required;
- 1. The run was successful, but external files were used to store the factors (only MA55 and MA62 offer this option); and
- 5. The run was successful, but negative eigenvalue were reported (due to rounding).

Table 2.2.1: Return code

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	0	0	0	0	0	0
audikw_1.rsa	-2	-2	-2	-2	-99	-2
barth5.kp	0	0	0	0	0	0
bcsstk25.RSA	0	0	0	0	0	0
bcsstk29.PSA	0	0	0	0	0	0
bcsstk30.PSA	0	0	0	0	0	0
bcsstk31.PSA	0	0	0	0	0	0
bcsstk32.PSA	0	0	0	0	0	0
bcsstk36.RSA	0	0	0	0	0	0
bmw7st_1.rsa	0	0	0	0	1	0
bmwcra_1.rsa	0	0	0	0	0	0
bodyy4.RSA	0	0	0	0	0	0
bodyy5.RSA	0	0	0	0	0	0
bodyy6.RSA	0	0	0	0	0	0
cf1.RSA	0	0	0	0	0	0
cf2.RSA	0	0	0	0	1	0
copter1.kp	0	0	0	0	0	0
copter2.kp	0	0	0	0	0	0
crankseg_1.rsa	0	0	0	0	0	0
crankseg_2.rsa	0	0	0	0	0	0

Table 2.2.1: Return code (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
crplat2.PSE	0	0	0	0	0	0
ct20stif.PSA	0	0	0	0	0	0
CVXBQP1.rsa	0	0	0	0	0	0
Fcondp2.PSE	0	0	1	0	1	0
finan512.RSA	0	0	0	0	0	0
finance256.kp	0	0	0	0	0	0
ford1.kp	0	0	0	0	0	0
ford2.kp	0	0	0	0	0	0
Fullb.PSE	0	0	1	0	1	0
gearbox.PSA	0	0	0	0	0	0
GRIDGENA.rsa	0	0	0	0	0	0
gupta1.PSA	0	0	0	0	-99	5
gupta2.PSA	-99	0	-99	0	-99	-99
gupta3.PSA	0	0	0	0	-99	0
Halfb.PSE	0	0	0	0	1	0
hood.rsa	0	0	0	0	1	0
inline_1.rsa	0	0	-2	0	1	0
JNLBRNG1.rsa	0	0	0	0	0	0
ldoor.rsa	0	0	-99	0	-22	0
MINSURFO.rsa	0	0	0	0	0	0
msc10848.RSA	0	0	0	0	0	0
msc23052.RSA	0	0	0	0	0	0
M_T1.rsa	0	0	0	0	0	0
nasasrb.RSA	0	0	0	0	0	0
OBSTCLAE.rsa	0	0	0	0	0	0
OILPAN.rsa	0	0	0	0	0	0
onera_dual.kp	0	0	0	0	0	0
opt1.PSE	0	0	0	0	0	0
pds10.kp	0	0	0	0	0	0
pkustk01.PSA	0	0	0	0	0	0
pkustk02.PSA	0	0	0	0	0	0
pkustk03.PSA	0	0	0	0	0	0
pkustk04.PSA	0	0	0	0	0	0
pkustk05.PSA	0	0	0	0	0	0
pkustk06.PSA	0	0	0	0	0	0
pkustk07.PSA	0	0	0	0	0	0
pkustk08.PSA	0	0	0	0	0	0
pkustk09.PSA	0	0	0	0	0	0
pkustk10.PSA	0	0	0	0	0	0
pkustk11.PSA	0	0	0	0	0	0
pkustk12.PSA	0	0	0	0	0	0
pkustk13.PSA	0	0	0	0	0	0
pkustk14.PSA	0	0	0	0	0	0
pwt.RSA	0	0	0	0	0	0
pwtk.RSA	0	0	0	0	0	0
ramage02.PSE	0	0	0	0	0	0
s3dkq4m2.rsa	0	0	0	0	0	0
s3dkt3m2.rsa	0	0	0	0	0	0

Table 2.2.1: Return code (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
SHIPSEC1.rsa	0	0	0	0	0	0
SHIPSEC5.rsa	0	0	0	0	0	0
SHIPSEC8.rsa	0	0	0	0	0	0
SHIP_001.rse	0	0	0	0	0	0
SHIP_003.rsa	0	0	0	0	0	0
shuttle_eddy.PSA	0	0	0	0	0	0
skirt.PSA	0	0	0	0	0	0
Srb1.PSE	0	0	0	0	0	0
struct3.PSA	0	0	0	0	0	0
tandem_dual.kp	0	0	0	0	0	0
tandem_vtx.kp	0	0	0	0	0	0
THREAD.rsa	0	0	0	0	0	0
TORSION1.rsa	0	0	0	0	0	0
trdheim.PSE	0	0	0	0	0	0
Troll.PSE	0	0	-99	0	1	0
tsyl201.PSE	0	0	0	0	0	0
vanbody.rsa	0	0	0	0	0	0
wathen100.mat	0	0	0	0	0	0
wathen120.mat	0	0	0	0	0	0
X104.rsa	0	0	0	0	0	0

Table 2.2.2: Total time (CPU seconds)

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	284.644	142.652	366.641	70.937	333.065	99.173
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	0.249	0.357	2.495	0.256	1.387	1.591
bcsstk25.RSA	1.935	1.887	5.108	1.311	3.662	6.172
bcsstk29.PSA	2.434	1.946	10.205	1.527	5.877	2.575
bcsstk30.PSA	6.631	5.620	53.798	3.570	14.314	6.163
bcsstk31.PSA	14.130	14.202	41.443	7.194	34.971	15.856
bcsstk32.PSA	7.394	6.798	68.821	4.235	43.832	6.322
bcsstk36.RSA	3.487	3.535	19.057	2.366	15.168	2.816
bmw7st_1.rsa	95.311	71.219	1406.056	40.708	341.303	67.927
bmwcra_1.rsa	966.764	706.455	962.291	273.179	604.636	533.720
bodyy4.RSA	0.449	0.568	4.451	0.407	1.787	2.205
bodyy5.RSA	0.456	0.575	4.345	0.434	1.918	2.218
bodyy6.RSA	0.501	0.645	5.153	0.463	1.973	3.244
cf1.RSA	385.291	236.322	429.075	101.321	140.512	723.724
cf2.RSA	1258.493	867.062	532.376	219.752	414.493	1428.804
copter1.kp	6.146	5.824	63.463	3.803	10.366	25.635
copter2.kp	125.050	107.374	649.892	31.560	65.100	197.297
crankseg_1.rsa	394.905	193.291	439.546	103.226	328.286	230.285
crankseg_2.rsa	727.897	467.346	726.183	196.529	532.293	346.514
crplat2.PSE	6.795	3.684	8.423	2.868	2.928	4.113
ct20stif.PSA	73.130	42.754	1010.020	22.636	167.439	35.265
CVXBQP1.rsa	29.626	29.017	246.476	9.135	20.222	12.847

Table 2.2.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
Fcondp2.PSE	412.330	223.417	4860.349	101.953	1236.224	185.727
finan512.RSA	33.710	64.407	55.317	8.330	8.457	90.235
finance256.kp	19.556	12.583	34.117	2.924	4.554	16.048
ford1.kp	0.230	0.377	8.778	0.251	1.894	1.511
ford2.kp	2.797	3.352	346.955	2.098	30.293	19.963
Fullb.PSE	1591.850	1241.708	2531.593	409.206	1231.500	809.651
gearbox.PSA	331.701	176.523	859.303	104.007	446.141	226.437
GRIDGENA.rsa	2.578	3.191	23.442	2.146	11.251	7.315
gupta1.PSA	1521.624	350.697	5619.201	114.422	—	339.602
gupta2.PSA	—	2623.097	—	379.416	—	—
gupta3.PSA	495.161	221.032	216.892	114.926	—	543.800
Halfb.PSE	860.331	553.460	1906.966	185.582	861.574	342.254
hood.rsa	57.862	37.787	583.104	28.904	321.894	32.901
inline_1.rsa	2201.918	1094.353	—	540.030	2952.900	1108.815
JNLBRNG1.rsa	0.948	1.249	3.161	0.766	5.586	3.421
ldoor.rsa	835.864	529.250	—	283.736	—	402.945
MINSURFO.rsa	0.932	1.264	3.255	0.764	5.809	3.927
msc10848.RSA	3.038	2.702	19.963	2.114	11.006	2.664
msc23052.RSA	3.413	2.811	32.666	2.286	18.932	2.787
M_T1.rsa	136.680	119.997	575.615	52.030	183.215	92.911
nasasrb.RSA	27.874	23.303	18.879	13.487	36.093	25.213
OBSTCLAE.rsa	0.971	1.271	3.341	0.734	5.512	3.554
OILPAN.rsa	21.538	14.927	94.007	12.180	54.815	7.772
onera_dual.kp	80.574	75.960	2653.691	24.634	78.628	105.903
opt1.PSE	15.693	14.656	15.238	8.254	9.858	12.896
pds10.kp	12.289	12.881	147.205	11.436	25.338	171.558
pkustk01.PSA	2.317	2.068	15.665	1.723	11.530	1.915
pkustk02.PSA	1.590	1.352	22.304	1.210	4.907	1.207
pkustk03.PSA	15.571	13.564	305.235	9.886	80.333	10.784
pkustk04.PSA	74.187	53.964	589.068	24.806	162.913	44.395
pkustk05.PSA	105.347	84.891	182.308	38.739	48.604	58.496
pkustk06.PSA	127.075	104.041	165.515	47.892	99.919	96.820
pkustk07.PSA	135.619	90.977	137.978	31.219	53.193	47.427
pkustk08.PSA	206.889	152.618	162.197	51.936	93.121	121.779
pkustk09.PSA	9.184	9.122	30.846	5.849	23.919	8.132
pkustk10.PSA	53.930	32.795	509.290	24.413	326.666	34.916
pkustk11.PSA	573.633	356.333	702.133	150.308	413.649	286.676
pkustk12.PSA	85.119	49.272	1617.605	22.817	620.641	30.388
pkustk13.PSA	273.622	230.256	1598.886	98.309	380.316	141.457
pkustk14.PSA	1354.904	934.334	1676.187	423.701	565.674	855.135
pwt.RSA	1.423	1.523	5.903	1.079	5.768	6.632
pwtk.RSA	367.242	208.606	389.571	95.806	386.287	243.934
ramage02.PSE	263.343	226.562	101.678	77.036	55.474	104.843
s3dkq4m2.rsa	91.094	54.264	77.341	28.263	104.191	85.509
s3dkt3m2.rsa	58.887	40.055	43.782	17.928	64.280	38.657
SHIPSEC1.rsa	307.130	221.897	2764.637	99.402	753.117	268.539
SHIPSEC5.rsa	469.105	371.861	1274.134	151.747	592.985	1004.356
SHIPSEC8.rsa	602.084	567.689	1925.194	149.770	639.783	602.873

Table 2.2.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
SHIP_001.rse	56.425	58.493	19.663	29.918	16.966	55.432
SHIP_003.rsa	1150.728	904.103	882.555	331.452	441.359	2966.466
shuttle_eddy.PSA	0.249	0.281	1.118	0.206	1.037	1.355
skirt.PSA	0.353	0.453	1.115	0.344	1.816	1.234
Srb1.PSE	17.841	15.517	14.880	9.827	14.536	16.334
struct3.PSA	5.956	5.261	10.277	4.216	21.324	8.161
tandem_dual.kp	57.705	40.797	1269.871	21.881	58.714	90.349
tandem_vtx.kp	5.285	4.469	40.386	3.145	6.446	19.286
THREAD.rsa	386.487	254.019	476.691	91.781	79.960	235.163
TORSION1.rsa	0.969	1.236	3.253	0.739	5.564	3.564
trdheim.PSE	1.962	1.606	2.306	1.341	1.181	1.597
Troll.PSE	1708.799	1591.312	—	331.714	5693.469	973.532
tsyl201.PSE	18.872	14.732	14.146	9.529	12.106	11.564
vanbody.rsa	7.875	6.260	174.985	5.127	48.598	7.691
wathen100.mat	1.613	1.407	25.640	0.966	8.076	4.017
wathen120.mat	2.149	1.750	32.650	1.230	9.237	5.204
X104.rsa	75.180	63.919	536.451	28.460	196.502	46.436

Table 2.2.3: Analyse time (CPU seconds)

Name	MA27	MA47	MA55	MA57	MA62
3dtube.PSA	0.887	1.289	0.700	0.778	39.992
audikw_1.rsa	—	—	—	—	—
barth5.kp	0.085	0.155	0.140	0.074	0.731
bcsstk25.RSA	0.186	0.305	0.182	0.123	2.165
bcsstk29.PSA	0.146	0.236	0.238	0.133	3.876
bcsstk30.PSA	0.475	0.713	0.437	0.474	7.084
bcsstk31.PSA	0.491	0.787	0.392	0.379	7.846
bcsstk32.PSA	0.530	0.809	0.509	0.498	11.148
bcsstk36.RSA	0.224	0.339	0.190	0.228	5.551
bmw7st_1.rsa	1.886	2.586	1.609	1.729	38.180
bmwcra_1.rsa	3.719	5.110	2.885	2.825	110.814
bodyy4.RSA	0.090	0.170	0.158	0.079	0.722
bodyy5.RSA	0.095	0.175	0.150	0.084	0.768
bodyy6.RSA	0.097	0.184	0.149	0.085	0.781
cf1.RSA	2.692	3.925	1.636	1.140	21.989
cf2.RSA	3.632	5.573	2.657	1.711	38.463
copter1.kp	0.300	0.476	0.623	0.142	2.265
copter2.kp	1.357	2.049	2.083	0.754	8.532
crankseg_1.rsa	2.422	3.277	1.957	2.338	116.734
crankseg_2.rsa	3.165	4.148	2.511	2.925	169.814
crplat2.PSE	0.178	0.258	0.142	0.185	0.160
ct20stif.PSA	0.776	1.172	0.838	0.705	15.453
CVXBQP1.rsa	0.542	0.985	1.040	0.473	4.222
Fcondp2.PSE	2.634	3.498	2.460	2.403	2.248
finan512.RSA	0.871	1.351	1.030	0.420	4.077
finance256.kp	0.427	0.604	0.528	0.174	1.887

Table 2.2.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62
ford1.kp	0.095	0.183	0.205	0.086	1.049
ford2.kp	0.661	1.249	2.420	0.603	7.658
Fullb.PSE	2.875	4.168	2.405	2.650	3.827
gearbox.PSA	2.755	3.952	2.579	2.379	73.314
GRIDGENA.rsa	0.387	0.762	0.496	0.316	4.551
gupta1.PSA	1515.799	344.819	1.863	105.480	–
gupta2.PSA	–	2586.486	–	327.517	–
gupta3.PSA	454.347	198.095	5.474	34.416	–
Halfb.PSE	3.093	4.894	2.536	2.786	4.234
hood.rsa	2.591	3.528	2.178	2.531	38.588
inline_1.rsa	12.731	18.209	–	10.444	343.457
JNLBRNG1.rsa	0.190	0.394	0.253	0.165	2.482
ldoor.rsa	12.263	16.987	–	11.522	–
MINSURFO.rsa	0.196	0.394	0.248	0.177	2.602
msc10848.RSA	0.227	0.315	0.186	0.234	5.051
msc23052.RSA	0.241	0.345	0.190	0.268	4.232
M_T1.rsa	2.080	3.013	1.770	2.034	0.826
nasasrb.RSA	0.861	1.204	0.714	0.739	17.552
OBSTCLAE.rsa	0.184	0.382	0.244	0.160	2.591
OILPAN.rsa	0.793	1.240	0.686	0.753	20.935
onera_dual.kp	1.011	1.765	4.783	0.660	7.306
opt1.PSE	0.395	0.587	0.335	0.394	0.262
pds10.kp	5.378	5.338	0.392	0.356	4.392
pkustk01.PSA	0.190	0.275	0.164	0.206	4.282
pkustk02.PSA	0.132	0.196	0.119	0.147	1.882
pkustk03.PSA	0.685	0.951	0.583	0.667	11.849
pkustk04.PSA	1.703	1.606	0.793	1.130	21.678
pkustk05.PSA	0.517	0.800	0.403	0.507	14.063
pkustk06.PSA	0.603	0.895	0.468	0.562	16.603
pkustk07.PSA	0.576	0.828	0.506	0.493	16.047
pkustk08.PSA	0.793	1.118	0.701	0.663	22.581
pkustk09.PSA	0.325	0.507	0.271	0.350	5.828
pkustk10.PSA	0.950	1.334	0.814	0.918	17.942
pkustk11.PSA	1.298	1.902	0.982	1.177	33.299
pkustk12.PSA	3.706	2.809	1.518	2.076	31.718
pkustk13.PSA	2.005	2.760	2.238	1.709	42.334
pkustk14.PSA	3.809	5.571	3.133	3.352	98.787
pwt.RSA	0.235	0.474	0.297	0.184	3.069
pwtk.RSA	2.856	3.597	2.172	2.507	65.590
ramage02.PSE	0.623	1.001	0.549	0.582	0.523
s3dkq4m2.rsa	1.297	1.517	0.824	1.061	27.954
s3dkt3m2.rsa	0.964	1.256	0.651	0.849	13.358
SHIPSEC1.rsa	1.931	2.910	1.703	1.846	2.480
SHIPSEC5.rsa	2.490	3.569	1.972	2.237	3.159
SHIPSEC8.rsa	1.669	2.587	1.380	1.564	2.218
SHIP_001.rse	0.961	1.545	0.639	0.855	0.408
SHIP_003.rsa	2.049	3.332	1.586	1.803	3.087
shuttle_eddy.PSA	0.061	0.106	0.092	0.049	0.725

Table 2.2.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62
skirt.PSA	0.109	0.179	0.118	0.080	1.443
Srb1.PSE	0.627	0.928	0.476	0.661	0.469
struct3.PSA	0.495	0.801	0.652	0.449	10.803
tandem_dual.kp	1.078	1.973	3.791	0.762	7.606
tandem_vtx.kp	0.275	0.459	0.367	0.175	2.239
THREAD.rsa	1.062	1.635	0.967	0.970	0.765
TORSION1.rsa	0.184	0.378	0.247	0.160	2.613
trdheim.PSE	0.369	0.511	0.271	0.386	0.108
Troll.PSE	3.389	5.462	–	2.967	3.633
tsyl201.PSE	0.451	0.661	0.347	0.497	0.126
vanbody.rsa	0.610	0.864	0.574	0.587	12.474
wathen100.mat	0.177	0.301	0.591	0.146	3.084
wathen120.mat	0.216	0.363	0.722	0.181	3.235
X104.rsa	2.182	2.907	1.761	2.129	0.791

Table 2.2.4: Factorize time (CPU seconds)

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	283.135	140.605	362.277	69.512	290.934	98.491
audikw_1.rsa	–	–	–	–	–	–
barth5.kp	0.151	0.184	2.241	0.168	0.607	1.572
bcsstk25.RSA	1.707	1.515	4.715	1.146	1.421	6.120
bcsstk29.PSA	2.242	1.651	9.678	1.346	1.910	2.521
bcsstk30.PSA	6.047	4.752	52.490	2.988	6.987	6.032
bcsstk31.PSA	13.497	13.211	39.962	6.670	26.589	15.668
bcsstk32.PSA	6.718	5.783	67.060	3.585	32.050	6.146
bcsstk36.RSA	3.190	3.099	18.358	2.057	9.355	2.730
bmw7st_1.rsa	92.769	67.675	1393.424	38.242	289.081	67.079
bmwcra_1.rsa	960.771	697.669	950.002	268.082	488.971	531.108
bodyy4.RSA	0.338	0.360	4.118	0.306	0.997	2.176
bodyy5.RSA	0.341	0.371	4.013	0.324	1.077	2.188
bodyy6.RSA	0.379	0.427	4.810	0.353	1.115	3.211
cf1.RSA	381.614	230.926	424.270	99.283	116.919	722.472
cf2.RSA	1252.786	858.717	522.977	216.344	361.188	1425.996
copter1.kp	5.784	5.253	62.282	3.597	7.886	25.559
copter2.kp	123.292	104.710	644.644	30.434	55.497	196.834
crankseg_1.rsa	391.589	188.803	433.692	99.986	209.591	229.178
crankseg_2.rsa	723.430	461.289	718.307	192.267	359.716	345.010
crplat2.PSE	6.534	3.322	7.965	2.605	2.646	4.023
ct20stif.PSA	72.056	41.142	1004.250	21.635	150.426	34.921
CVXBQP1.rsa	28.938	27.830	243.263	8.533	15.457	12.691
Fcondp2.PSE	408.386	218.055	4719.683	98.323	1196.173	184.310
finan512.RSA	32.671	62.752	53.098	7.770	4.106	90.006
finance256.kp	19.040	11.852	32.946	2.681	2.514	15.943
ford1.kp	0.126	0.176	8.325	0.153	0.788	1.492
ford2.kp	2.030	1.925	340.911	1.379	21.802	19.810
Fullb.PSE	1586.951	1233.571	2426.572	404.408	1204.684	807.272

Table 2.2.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
gearbox.PSA	327.755	170.992	849.593	100.428	369.015	224.909
GRIDGENA.rsa	2.098	2.251	22.198	1.730	6.398	7.195
gupta1.PSA	5.725	5.727	5603.730	8.853	—	339.496
gupta2.PSA	—	36.178	—	51.656	—	—
gupta3.PSA	40.668	22.740	210.508	80.356	—	543.646
Halfb.PSE	855.605	545.939	1883.876	181.174	838.668	340.448
hood.rsa	54.536	33.242	571.787	25.556	269.146	32.007
inline_1.rsa	2183.635	1068.441	—	524.088	2508.802	1097.988
JNLBRNG1.rsa	0.715	0.782	2.610	0.554	2.931	3.362
ldoor.rsa	819.626	506.715	—	267.793	—	398.117
MINSURFO.rsa	0.694	0.797	2.705	0.544	3.028	3.867
msc10848.RSA	2.762	2.324	19.455	1.828	5.829	2.608
msc23052.RSA	3.097	2.374	31.811	1.937	14.394	2.698
M_T1.rsa	133.873	115.590	567.724	49.208	179.889	91.918
nasasrb.RSA	26.697	21.678	17.306	12.427	18.009	24.828
OBSTCLAE.rsa	0.745	0.812	2.787	0.532	2.753	3.495
OILPAN.rsa	20.488	13.327	91.177	11.133	33.010	7.559
onera_dual.kp	79.239	73.699	2641.563	23.660	69.843	105.512
opt1.PSE	15.178	13.892	14.546	7.731	9.402	12.751
pds10.kp	6.861	7.463	146.052	11.030	20.645	171.508
pkustk01.PSA	2.071	1.719	15.045	1.451	7.030	1.850
pkustk02.PSA	1.425	1.114	21.808	1.028	2.934	1.170
pkustk03.PSA	14.655	12.235	301.339	8.966	67.328	10.500
pkustk04.PSA	72.210	51.978	584.070	23.397	139.808	44.074
pkustk05.PSA	104.500	83.641	179.935	37.878	33.934	58.103
pkustk06.PSA	126.086	102.589	162.987	46.895	82.268	96.312
pkustk07.PSA	134.763	89.811	136.324	30.470	36.704	47.160
pkustk08.PSA	205.709	151.006	159.998	50.900	69.831	121.342
pkustk09.PSA	8.727	8.415	29.739	5.350	17.653	7.957
pkustk10.PSA	52.518	30.833	503.518	22.989	305.718	34.360
pkustk11.PSA	571.259	353.007	694.593	148.048	377.034	285.487
pkustk12.PSA	81.018	45.957	1607.180	20.373	584.976	29.984
pkustk13.PSA	270.788	226.195	1587.994	95.665	334.801	140.460
pkustk14.PSA	1348.285	924.885	1662.524	417.383	461.937	851.639
pwt.RSA	1.129	0.974	5.301	0.834	2.544	6.553
pwtk.RSA	362.880	202.923	379.240	91.822	316.038	241.900
ramage02.PSE	262.303	224.993	100.079	76.025	54.424	104.428
s3dkq4m2.rsa	89.246	52.017	74.076	26.680	74.723	84.644
s3dkt3m2.rsa	57.444	38.140	41.258	16.632	49.697	38.033
SHIPSEC1.rsa	304.253	217.508	2747.435	96.551	744.308	267.278
SHIPSEC5.rsa	465.428	366.155	1259.680	148.190	583.851	1002.688
SHIPSEC8.rsa	599.367	563.205	1911.435	147.161	632.451	601.495
SHIP_001.rse	55.134	56.319	18.382	28.690	16.144	54.964
SHIP_003.rsa	1146.890	897.833	871.827	327.727	434.240	2964.043
shuttle_eddy.PSA	0.177	0.162	0.971	0.148	0.295	1.339
skirt.PSA	0.230	0.256	0.938	0.250	0.350	1.214
Srb1.PSE	16.968	14.182	13.644	8.897	13.602	15.980
struct3.PSA	5.308	4.259	9.027	3.608	10.112	7.960

Table 2.2.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
tandem_dual.kp	56.302	38.348	1260.301	20.786	49.726	89.951
tandem_vtx.kp	4.939	3.908	39.507	2.895	4.047	19.194
THREAD.rsa	384.814	251.523	472.842	90.203	78.339	234.379
TORSION1.rsa	0.743	0.788	2.727	0.536	2.784	3.506
trdheim.PSE	1.543	1.029	1.869	0.905	1.006	1.538
Troll.PSE	1702.963	1582.223	—	326.494	5591.740	970.426
tsyl201.PSE	18.277	13.866	13.335	8.869	11.702	11.382
vanbody.rsa	7.108	5.185	172.272	4.375	35.408	7.496
wathen100.mat	1.381	1.038	24.467	0.769	4.796	3.929
wathen120.mat	1.864	1.302	31.227	0.985	5.769	5.094
X104.rsa	72.407	60.145	528.906	25.713	193.276	45.752

Table 2.2.5: Solution time given factors (CPU seconds)

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	0.622	0.758	3.665	0.647	2.139	0.682
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	0.013	0.018	0.114	0.014	0.049	0.019
bcsstk25.RSA	0.042	0.066	0.212	0.042	0.076	0.052
bcsstk29.PSA	0.046	0.059	0.289	0.046	0.091	0.054
bcsstk30.PSA	0.108	0.154	0.871	0.108	0.242	0.132
bcsstk31.PSA	0.142	0.204	1.088	0.145	0.537	0.188
bcsstk32.PSA	0.146	0.206	1.251	0.152	0.634	0.176
bcsstk36.RSA	0.073	0.098	0.509	0.080	0.263	0.086
bmw7st_1.rsa	0.657	0.957	11.022	0.737	14.043	0.848
bmwcra_1.rsa	2.274	3.676	9.404	2.273	4.852	2.612
bodyy4.RSA	0.020	0.038	0.175	0.020	0.067	0.028
bodyy5.RSA	0.020	0.029	0.182	0.022	0.073	0.030
bodyy6.RSA	0.023	0.034	0.194	0.024	0.077	0.033
cf1.RSA	0.985	1.470	3.169	0.899	1.604	1.252
cf2.RSA	1.988	2.772	6.742	1.684	14.842	2.808
copter1.kp	0.062	0.095	0.558	0.063	0.215	0.076
copter2.kp	0.401	0.615	3.165	0.372	1.071	0.464
crankseg_1.rsa	0.894	1.210	3.897	0.902	1.961	1.107
crankseg_2.rsa	1.302	1.909	5.365	1.337	2.762	1.504
crplat2.PSE	0.083	0.104	0.315	0.078	0.122	0.090
ct20stif.PSA	0.298	0.439	4.931	0.297	1.561	0.344
CVXBQP1.rsa	0.146	0.203	2.173	0.129	0.543	0.156
Fcondp2.PSE	1.310	1.864	138.206	1.227	37.803	1.417
finan512.RSA	0.169	0.305	1.189	0.141	0.274	0.229
finance256.kp	0.090	0.127	0.643	0.069	0.153	0.105
ford1.kp	0.010	0.019	0.248	0.012	0.057	0.019
ford2.kp	0.106	0.178	3.625	0.116	0.834	0.153
Fullb.PSE	2.024	3.969	102.615	2.148	22.989	2.379
gearbox.PSA	1.191	1.579	7.132	1.200	3.811	1.527
GRIDGENA.rsa	0.092	0.178	0.748	0.100	0.303	0.120
gupta1.PSA	0.099	0.151	13.607	0.089	—	0.106

Table 2.2.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
gupta2.PSA	–	0.432	–	0.243	–	–
gupta3.PSA	0.146	0.197	0.910	0.154	–	0.154
Halfb.PSE	1.634	2.627	20.555	1.621	18.672	1.806
hood.rsa	0.735	1.017	9.138	0.818	14.160	0.894
inline_1.rsa	5.552	7.703	–	5.498	100.641	10.827
JNLBRNG1.rsa	0.042	0.073	0.299	0.047	0.173	0.059
ldoor.rsa	3.974	5.548	–	4.421	–	4.828
MINSURFO.rsa	0.042	0.072	0.302	0.044	0.179	0.061
msc10848.RSA	0.049	0.062	0.322	0.052	0.126	0.057
msc23052.RSA	0.075	0.093	0.665	0.080	0.305	0.090
M_T1.rsa	0.727	1.395	6.121	0.788	2.501	0.994
nasasrb.RSA	0.316	0.421	0.858	0.321	0.532	0.385
OBSTCLAE.rsa	0.042	0.077	0.309	0.042	0.168	0.059
OILPAN.rsa	0.258	0.360	2.144	0.294	0.870	0.213
onera_dual.kp	0.323	0.497	7.344	0.314	1.480	0.390
opt1.PSE	0.120	0.177	0.357	0.129	0.194	0.144
pds10.kp	0.050	0.080	0.761	0.050	0.302	0.051
pkustk01.PSA	0.056	0.074	0.456	0.061	0.218	0.064
pkustk02.PSA	0.033	0.042	0.377	0.035	0.092	0.037
pkustk03.PSA	0.230	0.379	3.314	0.254	1.156	0.282
pkustk04.PSA	0.271	0.380	4.204	0.278	1.427	0.321
pkustk05.PSA	0.329	0.449	1.971	0.355	0.607	0.390
pkustk06.PSA	0.386	0.556	2.061	0.429	1.048	0.508
pkustk07.PSA	0.277	0.339	1.149	0.249	0.442	0.266
pkustk08.PSA	0.387	0.494	1.498	0.372	0.710	0.437
pkustk09.PSA	0.132	0.200	0.836	0.148	0.438	0.175
pkustk10.PSA	0.463	0.628	4.958	0.482	3.006	0.554
pkustk11.PSA	1.061	1.424	6.559	1.079	3.315	1.186
pkustk12.PSA	0.394	0.507	8.908	0.368	3.947	0.404
pkustk13.PSA	0.829	1.301	8.654	0.927	3.181	0.997
pkustk14.PSA	2.794	3.878	10.530	2.966	4.950	3.496
pwt.RSA	0.059	0.074	0.305	0.061	0.155	0.079
pwtk.RSA	1.507	2.087	8.159	1.477	4.659	2.034
ramage02.PSE	0.418	0.567	1.050	0.429	0.527	0.415
s3dkq4m2.rsa	0.550	0.730	2.441	0.522	1.515	0.866
s3dkt3m2.rsa	0.478	0.659	1.874	0.447	1.225	0.625
SHIPSEC1.rsa	0.946	1.478	15.499	1.005	6.328	1.261
SHIPSEC5.rsa	1.187	2.136	12.481	1.321	5.975	1.668
SHIPSEC8.rsa	1.047	1.897	12.379	1.045	5.114	1.378
SHIP_001.rse	0.330	0.629	0.642	0.374	0.414	0.467
SHIP_003.rsa	1.790	2.938	9.142	1.922	4.031	2.423
shuttle_eddy.PSA	0.011	0.013	0.056	0.009	0.018	0.016
skirt.PSA	0.014	0.019	0.059	0.014	0.023	0.020
Srb1.PSE	0.247	0.407	0.760	0.269	0.465	0.354
struct3.PSA	0.152	0.200	0.598	0.159	0.409	0.201
tandem_dual.kp	0.325	0.475	5.779	0.333	1.382	0.398
tandem_vtx.kp	0.071	0.102	0.511	0.075	0.160	0.092
THREAD.rsa	0.611	0.861	2.882	0.608	0.856	0.785

Table 2.2.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
TORSION1.rsa	0.042	0.070	0.279	0.043	0.167	0.059
trdheim.PSE	0.050	0.066	0.166	0.051	0.066	0.059
Troll.PSE	2.448	3.628	–	2.253	98.096	3.106
tsyl201.PSE	0.144	0.205	0.464	0.163	0.278	0.182
vanbody.rsa	0.157	0.211	2.139	0.165	0.716	0.195
wathen100.mat	0.056	0.068	0.581	0.051	0.195	0.088
wathen120.mat	0.069	0.085	0.701	0.064	0.233	0.110
X104.rsa	0.591	0.868	5.785	0.619	2.435	0.684

Table 2.2.6: Minimum memory required (Mbytes)

Name	MA55	MA57	MA62	MA67
3dtube.PSA	6.6E+01	3.2E+02	1.2E+02	3.7E+02
audikw_1.rsa	–	–	–	–
barth5.kp	4.3E+00	5.8E+00	1.6E+00	7.0E+00
bcsstk25.RSA	2.4E+00	1.8E+01	5.1E+00	2.4E+01
bcsstk29.PSA	3.8E+01	2.7E+01	9.2E+00	3.2E+01
bcsstk30.PSA	9.8E+01	6.5E+01	1.8E+01	7.7E+01
bcsstk31.PSA	1.3E+01	7.1E+01	2.1E+01	1.1E+02
bcsstk32.PSA	1.4E+02	7.5E+01	3.1E+01	8.2E+01
bcsstk36.RSA	8.0E+01	4.5E+01	1.5E+01	4.7E+01
bmw7st_1.rsa	1.8E+03	3.6E+02	1.0E+02	4.3E+02
bmwcra_1.rsa	2.3E+02	1.0E+03	2.9E+02	1.2E+03
bodyy4.RSA	3.8E+00	8.6E+00	1.9E+00	1.0E+01
bodyy5.RSA	3.8E+00	9.0E+00	2.0E+00	1.1E+01
bodyy6.RSA	6.1E+00	9.6E+00	2.0E+00	1.2E+01
cf1.RSA	1.9E+02	4.0E+02	6.4E+01	7.1E+02
cf2.RSA	1.7E+02	7.2E+02	9.6E+01	1.5E+03
copter1.kp	2.7E+01	3.5E+01	8.5E+00	5.0E+01
copter2.kp	1.3E+02	1.6E+02	2.2E+01	2.3E+02
crankseg_1.rsa	2.8E+02	5.3E+02	2.3E+02	6.3E+02
crankseg_2.rsa	3.1E+02	7.8E+02	3.5E+02	8.5E+02
crplat2.PSE	2.1E+01	4.5E+01	2.0E+00	5.6E+01
ct20stif.PSA	6.4E+02	1.9E+02	6.0E+01	2.2E+02
CVXBQP1.rsa	4.4E+01	7.5E+01	7.6E+00	8.4E+01
Fcondp2.PSE	3.1E+03	6.5E+02	7.9E+01	7.6E+02
finan512.RSA	7.2E+00	8.1E+01	7.4E+00	2.6E+02
finance256.kp	1.5E+01	3.0E+01	4.0E+00	7.8E+01
ford1.kp	3.3E+00	5.6E+00	2.5E+00	6.4E+00
ford2.kp	3.5E+01	3.6E+01	1.4E+01	4.5E+01
Fullb.PSE	8.3E+02	1.2E+03	6.0E+01	1.5E+03
gearbox.PSA	8.0E+02	6.0E+02	2.0E+02	8.1E+02
GRIDGENA.rsa	2.1E+01	3.7E+01	9.8E+00	4.3E+01
gupta1.PSA	1.7E+03	1.6E+02	–	7.0E+01
gupta2.PSA	–	4.8E+02	–	–
gupta3.PSA	1.3E+02	4.4E+02	–	3.2E+02
Halfb.PSE	6.3E+02	8.2E+02	4.9E+01	9.9E+02

Table 2.2.6: Minimum memory required (Mbytes) (continued)

Name	MA55	MA57	MA62	MA67
hood.rsa	3.5E+02	3.9E+02	9.5E+01	3.9E+02
inline_1.rsa	–	2.5E+03	6.6E+02	2.9E+03
JNLBRNG1.rsa	1.7E+00	1.6E+01	6.2E+00	2.0E+01
ldoor.rsa	–	2.1E+03	-1.2E-05	2.1E+03
MINSURFO.rsa	1.8E+00	1.6E+01	6.3E+00	2.1E+01
msc10848.RSA	4.1E+01	3.8E+01	1.7E+01	4.0E+01
msc23052.RSA	9.6E+01	4.4E+01	1.7E+01	4.7E+01
M_T1.rsa	6.9E+02	4.3E+02	2.0E+01	5.2E+02
nasasrb.RSA	3.0E+01	1.4E+02	4.1E+01	1.8E+02
OBSTCLAE.rsa	1.6E+00	1.5E+01	6.1E+00	2.0E+01
OILPAN.rsa	9.7E+01	1.5E+02	5.1E+01	1.1E+02
onera_dual.kp	3.1E+02	1.7E+02	2.0E+01	2.2E+02
opt1.PSE	2.7E+01	9.0E+01	5.7E+00	1.1E+02
pds10.kp	8.2E+01	5.4E+01	2.2E+01	4.4E+01
pkustk01.PSA	5.0E+01	3.4E+01	1.3E+01	3.6E+01
pkustk02.PSA	5.6E+01	2.6E+01	8.3E+00	2.6E+01
pkustk03.PSA	3.9E+02	1.3E+02	4.0E+01	1.3E+02
pkustk04.PSA	5.5E+02	1.8E+02	9.0E+01	2.4E+02
pkustk05.PSA	2.9E+02	2.1E+02	4.3E+01	2.6E+02
pkustk06.PSA	1.8E+02	2.5E+02	5.8E+01	3.6E+02
pkustk07.PSA	1.5E+02	1.9E+02	3.9E+01	2.2E+02
pkustk08.PSA	4.5E+01	2.7E+02	5.4E+01	4.0E+02
pkustk09.PSA	5.8E+01	7.5E+01	1.9E+01	8.8E+01
pkustk10.PSA	7.9E+02	2.3E+02	7.0E+01	2.7E+02
pkustk11.PSA	8.5E+02	5.6E+02	1.2E+02	7.5E+02
pkustk12.PSA	1.3E+03	2.5E+02	2.4E+02	2.6E+02
pkustk13.PSA	4.8E+02	5.1E+02	1.3E+02	5.5E+02
pkustk14.PSA	9.6E+02	1.3E+03	2.7E+02	1.6E+03
pwt.RSA	4.0E+00	2.0E+01	6.9E+00	2.7E+01
pwtk.RSA	3.8E+02	6.8E+02	1.6E+02	9.0E+02
ramage02.PSE	5.0E+01	3.6E+02	1.8E+01	3.6E+02
s3dkq4m2.rsa	6.4E+01	2.6E+02	6.4E+01	4.1E+02
s3dkt3m2.rsa	7.1E+00	2.0E+02	3.0E+01	2.8E+02
SHIPSEC1.rsa	1.7E+03	5.3E+02	5.8E+01	6.6E+02
SHIPSEC5.rsa	4.8E+02	6.8E+02	4.3E+01	8.5E+02
SHIPSEC8.rsa	1.5E+03	5.9E+02	8.3E+01	8.4E+02
SHIP_001.rse	1.2E+01	2.3E+02	5.9E+00	2.6E+02
SHIP_003.rsa	5.0E+02	9.3E+02	4.5E+01	1.4E+03
shuttle_eddy.PS	9.0E-01	4.9E+00	2.0E+00	7.1E+00
skirt.PSA	2.0E+00	7.7E+00	3.7E+00	9.0E+00
Srb1.PSE	2.2E+01	1.3E+02	5.4E+00	1.6E+02
struct3.PSA	1.7E+01	6.2E+01	2.3E+01	7.9E+01
tandem_dual.kp	1.7E+02	1.5E+02	1.6E+01	1.7E+02
tandem_vtx.kp	2.6E+01	3.4E+01	5.7E+00	5.3E+01
THREAD.rsa	4.5E+02	3.8E+02	1.7E+01	5.6E+02
TORSION1.rsa	1.6E+00	1.5E+01	6.1E+00	2.0E+01
trdheim.PSE	5.8E+00	4.3E+01	1.5E+00	4.2E+01
Troll.PSE	–	1.2E+03	3.8E+02	1.7E+03

Table 2.2.6: Minimum memory required (Mbytes) (continued)

Name	MA55	MA57	MA62	MA67
tsyl201.PSE	1.9E+01	1.1E+02	4.7E+00	1.2E+02
vanbody.rsa	2.2E+02	8.6E+01	3.3E+01	9.6E+01
wathen100.mat	1.7E+01	2.1E+01	5.7E+00	3.9E+01
wathen120.mat	1.7E+01	2.6E+01	6.6E+00	4.9E+01
X104.rsa	7.7E+02	3.6E+02	3.4E+01	3.9E+02

Table 2.2.7: Actual memory used (Mbytes)

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	3.2E+02	3.9E+02	8.0E+02	3.4E+02	7.4E+02	6.1E+02
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	5.8E+00	6.8E+00	1.7E+01	6.8E+00	1.7E+01	1.3E+01
bcsstk25.RSA	1.9E+01	2.2E+01	3.0E+01	2.0E+01	3.3E+01	3.7E+01
bcsstk29.PSA	2.6E+01	2.8E+01	6.1E+01	3.0E+01	6.0E+01	4.8E+01
bcsstk30.PSA	6.9E+01	7.4E+01	1.8E+02	7.3E+01	8.8E+01	1.3E+02
bcsstk31.PSA	7.3E+01	9.3E+01	2.2E+02	7.6E+01	2.7E+02	1.4E+02
bcsstk32.PSA	8.0E+01	8.8E+01	2.4E+02	8.4E+01	2.1E+02	1.4E+02
bcsstk36.RSA	4.3E+01	4.9E+01	1.1E+02	5.0E+01	1.3E+02	7.7E+01
bmw7st_1.rsa	3.5E+02	4.1E+02	2.0E+03	3.9E+02	4.9E+02	8.0E+02
bmwcra_1.rsa	1.1E+03	1.2E+03	1.8E+03	1.1E+03	1.6E+03	2.0E+03
bodyy4.RSA	8.3E+00	9.6E+00	2.5E+01	9.5E+00	2.4E+01	1.4E+01
bodyy5.RSA	8.7E+00	9.9E+00	2.8E+01	1.0E+01	2.6E+01	1.5E+01
bodyy6.RSA	9.3E+00	1.1E+01	3.1E+01	1.1E+01	2.6E+01	1.6E+01
cf1.RSA	4.5E+02	5.1E+02	5.3E+02	4.1E+02	5.0E+02	1.1E+03
cf2.RSA	9.2E+02	1.1E+03	1.3E+03	7.4E+02	4.7E+02	1.9E+03
copter1.kp	3.0E+01	4.1E+01	5.6E+01	3.7E+01	7.4E+01	8.6E+01
copter2.kp	1.8E+02	2.6E+02	3.6E+02	1.7E+02	3.3E+02	4.5E+02
crankseg_1.rsa	5.4E+02	5.7E+02	8.4E+02	5.7E+02	1.1E+03	1.1E+03
crankseg_2.rsa	7.5E+02	9.1E+02	1.2E+03	8.4E+02	1.5E+03	1.4E+03
crplat2.PSE	4.7E+01	4.7E+01	7.1E+01	4.9E+01	3.9E+01	6.6E+01
ct20stif.PSA	1.7E+02	1.9E+02	8.2E+02	2.0E+02	5.0E+02	3.0E+02
CVXBQP1.rsa	6.4E+01	1.2E+02	3.2E+02	7.7E+01	1.4E+02	1.3E+02
Fcondp2.PSE	6.8E+02	7.5E+02	3.1E+03	7.0E+02	9.1E+01	1.2E+03
finan512.RSA	8.1E+01	1.8E+02	1.2E+02	8.4E+01	9.9E+01	4.3E+02
finance256.kp	5.9E+01	6.7E+01	6.5E+01	3.3E+01	5.6E+01	1.1E+02
ford1.kp	5.2E+00	6.7E+00	2.5E+01	6.5E+00	2.5E+01	8.9E+00
ford2.kp	3.7E+01	4.9E+01	3.8E+02	4.0E+01	2.6E+02	7.0E+01
Fullb.PSE	1.1E+03	1.5E+03	1.0E+03	1.3E+03	8.3E+01	2.3E+03
gearbox.PSA	6.0E+02	6.5E+02	1.3E+03	6.4E+02	1.2E+03	9.8E+02
GRIDGENA.rsa	3.6E+01	4.1E+01	1.2E+02	4.1E+01	1.1E+02	5.8E+01
gupta1.PSA	1.1E+02	7.3E+01	1.7E+03	1.7E+02	—	1.2E+02
gupta2.PSA	—	3.2E+02	—	5.0E+02	—	—
gupta3.PSA	2.4E+02	2.7E+02	3.0E+02	4.9E+02	—	5.6E+02
Halfb.PSE	8.8E+02	9.5E+02	3.1E+03	8.7E+02	5.2E+01	1.3E+03
hood.rsa	4.1E+02	4.2E+02	1.6E+03	4.4E+02	2.8E+02	7.2E+02
inline_1.rsa	2.7E+03	2.8E+03	—	2.6E+03	2.4E+03	3.3E+03
JNLBRNG1.rsa	1.6E+01	2.0E+01	5.6E+01	1.8E+01	6.6E+01	3.1E+01

Table 2.2.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
ldoor.rsa	2.1E+03	2.3E+03	–	2.3E+03	–	3.1E+03
MINSURFO.rsa	1.5E+01	2.0E+01	5.8E+01	1.8E+01	7.7E+01	3.2E+01
msc10848.RSA	3.7E+01	4.2E+01	7.9E+01	4.3E+01	5.9E+01	5.3E+01
msc23052.RSA	4.3E+01	4.6E+01	1.2E+02	4.9E+01	1.2E+02	7.8E+01
M_T1.rsa	4.4E+02	5.2E+02	1.2E+03	4.8E+02	7.6E+02	1.0E+03
nasasrb.RSA	1.6E+02	1.7E+02	2.1E+02	1.5E+02	1.9E+02	3.0E+02
OBSTCLAE.rsa	1.6E+01	2.0E+01	5.6E+01	1.7E+01	7.0E+01	3.1E+01
OILPAN.rsa	1.5E+02	1.6E+02	3.9E+02	1.6E+02	2.8E+02	1.6E+02
onera_dual.kp	1.5E+02	2.1E+02	7.8E+02	1.7E+02	4.2E+02	3.2E+02
opt1.PSE	8.2E+01	1.0E+02	9.6E+01	9.8E+01	6.6E+01	2.0E+02
pds10.kp	3.6E+01	5.7E+01	8.7E+01	5.5E+01	1.2E+02	1.9E+02
pkustk01.PSA	3.3E+01	3.6E+01	9.2E+01	3.8E+01	9.0E+01	6.7E+01
pkustk02.PSA	2.4E+01	2.6E+01	8.0E+01	2.9E+01	3.6E+01	3.6E+01
pkustk03.PSA	1.3E+02	1.4E+02	5.7E+02	1.5E+02	4.7E+02	2.1E+02
pkustk04.PSA	1.8E+02	2.2E+02	7.2E+02	2.0E+02	5.2E+02	4.5E+02
pkustk05.PSA	1.8E+02	2.5E+02	3.7E+02	2.1E+02	2.1E+02	2.8E+02
pkustk06.PSA	2.1E+02	2.9E+02	4.1E+02	2.6E+02	3.5E+02	5.0E+02
pkustk07.PSA	1.9E+02	2.5E+02	2.2E+02	2.0E+02	1.7E+02	2.5E+02
pkustk08.PSA	2.4E+02	3.5E+02	2.9E+02	2.8E+02	3.3E+02	6.2E+02
pkustk09.PSA	7.2E+01	8.5E+01	1.7E+02	8.2E+01	1.4E+02	1.1E+02
pkustk10.PSA	2.4E+02	2.5E+02	8.8E+02	2.5E+02	9.8E+02	4.7E+02
pkustk11.PSA	5.3E+02	6.6E+02	1.3E+03	5.8E+02	1.1E+03	1.0E+03
pkustk12.PSA	2.6E+02	2.9E+02	1.5E+03	2.8E+02	1.5E+03	4.8E+02
pkustk13.PSA	4.4E+02	5.8E+02	1.4E+03	5.4E+02	1.0E+03	7.1E+02
pkustk14.PSA	1.4E+03	1.6E+03	2.0E+03	1.4E+03	1.6E+03	2.8E+03
pwt.RSA	2.2E+01	2.2E+01	5.7E+01	2.3E+01	8.1E+01	3.8E+01
pwtk.RSA	7.6E+02	7.7E+02	1.8E+03	7.3E+02	1.6E+03	1.3E+03
ramage02.PSE	2.6E+02	4.2E+02	2.3E+02	3.7E+02	1.9E+02	5.6E+02
s3dkq4m2.rsa	2.9E+02	3.1E+02	5.4E+02	2.8E+02	4.9E+02	6.1E+02
s3dkt3m2.rsa	2.3E+02	2.6E+02	4.3E+02	2.2E+02	3.8E+02	4.2E+02
SHIPSEC1.rsa	5.0E+02	6.0E+02	2.7E+03	5.6E+02	1.9E+03	8.6E+02
SHIPSEC5.rsa	6.3E+02	7.7E+02	2.4E+03	7.3E+02	1.8E+03	1.1E+03
SHIPSEC8.rsa	6.0E+02	8.0E+02	2.2E+03	6.2E+02	1.6E+03	1.3E+03
SHIP_001.rse	2.0E+02	2.3E+02	1.9E+02	2.3E+02	1.3E+02	4.1E+02
SHIP_003.rsa	8.8E+02	1.1E+03	1.7E+03	9.7E+02	1.3E+03	2.9E+03
shuttle_eddy.PS	5.5E+00	5.4E+00	9.1E+00	5.8E+00	1.5E+01	1.1E+01
skirt.PSA	7.6E+00	8.8E+00	1.2E+01	9.1E+00	1.9E+01	1.8E+01
Srb1.PSE	1.4E+02	1.4E+02	2.0E+02	1.4E+02	1.5E+02	3.2E+02
struct3.PSA	6.5E+01	6.6E+01	1.3E+02	6.8E+01	1.4E+02	1.6E+02
tandem_dual.kp	1.3E+02	1.6E+02	5.9E+02	1.5E+02	4.0E+02	3.5E+02
tandem_vtx.kp	3.2E+01	3.8E+01	6.2E+01	3.6E+01	5.7E+01	9.2E+01
THREAD.rsa	3.7E+02	4.8E+02	5.4E+02	4.0E+02	2.8E+02	8.2E+02
TORSION1.rsa	1.6E+01	2.0E+01	5.6E+01	1.7E+01	7.0E+01	3.1E+01
trdheim.PSE	4.3E+01	4.5E+01	6.2E+01	5.1E+01	2.1E+01	4.5E+01
Troll.PSE	1.2E+03	1.9E+03	–	1.3E+03	3.9E+02	2.3E+03
tsyl201.PSE	9.7E+01	1.2E+02	1.3E+02	1.2E+02	8.8E+01	1.5E+02
vanbody.rsa	8.7E+01	9.2E+01	3.7E+02	9.7E+01	2.3E+02	1.6E+02
wathen100.mat	2.4E+01	2.5E+01	6.4E+01	2.4E+01	7.0E+01	4.8E+01

Table 2.2.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
wathen120.mat	2.9E+01	3.0E+01	7.6E+01	3.0E+01	8.3E+01	5.8E+01
X104.rsa	3.9E+02	4.5E+02	1.2E+03	4.1E+02	7.8E+02	6.5E+02

Table 2.2.8: Number of integers used for factors

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	605966	524276	45330	593848	5049719	626460
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	123403	70904	15606	129162	104348	132262
bcsstk25.RSA	206685	121194	15439	198909	177852	209754
bcsstk29.PSA	164054	110768	13992	128099	199811	154855
bcsstk30.PSA	246526	228137	28924	236964	500128	249051
bcsstk31.PSA	359617	275382	35588	350522	1154029	367849
bcsstk32.PSA	399379	349637	44609	386919	1398699	402057
bcsstk36.RSA	177756	174910	23052	175297	555652	179125
bmw7st_1.rsa	1269845	1207323	141347	1246423	7651674	1270721
bmwcra_1.rsa	2253391	1825517	148770	2197593	10985049	2375062
bodyy4.RSA	144924	85375	17546	151198	154977	155087
bodyy5.RSA	154740	92106	18589	161945	165395	162941
bodyy6.RSA	162022	97329	19366	169408	172021	172307
cfid1.RSA	1458859	881098	70656	1412135	3610944	1626804
cfid2.RSA	2075377	1338255	123440	1985564	8867138	2727641
copter1.kp	234198	141203	17222	234500	470607	231641
copter2.kp	846877	515896	55476	841598	2298037	868835
crankseg_1.rsa	656471	614873	52804	642792	4275525	672435
crankseg_2.rsa	811102	769929	63838	792897	6000880	816071
crplat2.PSE	149509	140783	18010	140341	248995	146069
ct20stif.PSA	550504	467759	52329	531992	3365549	550108
CVXBQP1.rsa	502641	285057	50000	517265	1073350	511422
Fcondp2.PSE	1842975	1829506	201822	1714767	17972157	1801148
finan512.RSA	863265	393079	74752	664470	679071	962430
finance256.kp	428830	195344	37376	340305	377395	512505
ford1.kp	133154	72042	18728	146364	132702	146205
ford2.kp	747396	414245	100196	813347	1811360	816886
Fullb.PSE	1990818	1940427	199187	1913535	18749023	1962343
gearbox.PSA	1824279	1489044	153746	1765801	8571720	1940829
GRIDGENA.rsa	504063	299658	48962	526713	683511	530500
gupta1.PSA	1803647	806026	31802	1809232	—	1852892
gupta2.PSA	—	2035497	—	4768120	—	—
gupta3.PSA	3934336	924295	16783	3778186	—	3922061
Halfb.PSE	2016527	1978850	224617	1947919	16449416	1980263
hood.rsa	1517468	1471014	220542	1512089	8570703	1494060
inline_1.rsa	7065856	5801539	—	6988037	46110842	7068536
JNLBRNG1.rsa	299064	167932	40000	323270	384568	336290
ldoor.rsa	6800039	6534636	—	6804193	—	6696997
MINSURFO.rsa	304401	171215	40806	329640	395712	346755
msc10848.RSA	95224	86326	10848	92944	252971	95738

Table 2.2.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
msc23052.RSA	177434	173612	23052	174049	663758	180207
M_T1.rsa	797407	797351	97578	774529	4660545	834744
nasasrb.RSA	626628	523228	54870	603335	1225047	645368
OBSTCLAE.rsa	298221	175215	40000	317667	378424	332958
OILPAN.rsa	512596	413366	73752	510375	1689022	475549
onera_dual.kp	893015	521480	85567	915200	3056164	918906
opt1.PSE	154514	139264	15449	148901	326289	155042
pds10.kp	390224	189532	16558	394219	661643	350307
pkustk01.PSA	159517	157941	22044	156184	468726	156235
pkustk02.PSA	77325	75733	10800	77333	171885	75251
pkustk03.PSA	476555	479943	63336	470191	2451561	490375
pkustk04.PSA	450742	396001	55590	438985	2553322	453335
pkustk05.PSA	469009	455565	37164	464093	1324259	458637
pkustk06.PSA	537107	542083	43164	553389	2310587	555721
pkustk07.PSA	239735	207191	16860	226852	906430	234716
pkustk08.PSA	319085	277400	22209	306356	1489012	322074
pkustk09.PSA	252075	255389	33960	250475	936448	258403
pkustk10.PSA	698881	694239	80676	686401	6560931	718771
pkustk11.PSA	1099753	1094483	87804	1083311	7349203	1100881
pkustk12.PSA	731087	643991	94653	716053	6481470	726311
pkustk13.PSA	1233024	1005857	94893	1221176	6331291	1231085
pkustk14.PSA	2336919	2226467	151926	2307409	10040622	2372094
pwt.RSA	327212	198220	36519	333560	354419	356173
pwtk.RSA	1929402	1848088	217918	1860514	10372177	2090978
ramage02.PSE	232539	207429	16830	227473	850996	232414
s3dkq4m2.rsa	754331	732309	90449	708519	3544953	1369225
s3dkt3m2.rsa	727253	734135	90449	614529	2463738	958434
SHIPSEC1.rsa	1283213	1271997	140874	1254413	12606491	2239816
SHIPSEC5.rsa	1627222	1602806	179860	1595055	12062958	3043370
SHIPSEC8.rsa	1170578	1120952	114919	1101607	10426982	1979218
SHIP_001.rse	388932	393285	34920	392291	725270	579956
SHIP_003.rsa	1598466	1553186	121728	1568906	8348966	2987914
shuttle_eddy.PSA	89671	53623	10429	90388	50126	97323
skirt.PSA	115209	66608	12598	113718	59363	120556
Srb1.PSE	446209	444267	54924	437039	972637	467465
struct3.PSA	598096	354942	53570	591639	939591	620671
tandem_dual.kp	976024	565029	94069	1009081	2857103	1015899
tandem_vtx.kp	258084	153247	18454	258293	354673	272590
THREAD.rsa	384472	353264	29736	372308	1335293	437980
TORSION1.rsa	298221	175215	40000	317667	378424	332958
trdheim.PSE	123355	123051	22098	118105	143053	125005
Troll.PSE	2237272	2116252	–	2160057	39477273	2316201
tsyl201.PSE	161289	159597	20685	158313	467631	164033
vanbody.rsa	413777	370171	47072	403711	1554411	417185
wathen100.mat	246826	174115	30401	242536	445816	283530
wathen120.mat	297021	209647	36441	291929	528289	342892
X104.rsa	841353	835775	108384	812715	4745045	985664

Table 2.2.9: Number of reals used for factors

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	31226319	30855854	92970854	27319452	81164498	28866979
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	402895	462930	1743029	370107	1491787	403101
bcsstk25.RSA	1637650	1713315	3006289	1438911	2713411	1734187
bcsstk29.PSA	1863770	1807411	6134544	1685820	3186021	1920845
bcsstk30.PSA	4600464	4590696	17195922	3792025	8630583	4733347
bcsstk31.PSA	6050471	6317014	25132571	5229432	18846343	6698793
bcsstk32.PSA	5900123	5964279	25042430	5056239	23104627	5794255
bcsstk36.RSA	2916254	2945312	10550662	2740147	9350339	2944749
bmw7st_1.rsa	28932892	29189102	233295546	26495558	128613328	30438046
bmwcra_1.rsa	109249922	111879454	197945406	95047287	176961881	111524538
bodyy4.RSA	633115	702263	2630774	583749	2279182	650775
bodyy5.RSA	668537	747286	3048649	616324	2434440	707989
bodyy6.RSA	722843	825364	3372829	676617	2531466	752506
cfid1.RSA	46746647	44175098	61115421	37162044	56969180	52776492
cfid2.RSA	95144418	90014274	150970473	68693513	140658054	119583184
copter1.kp	2670583	2767994	6394324	2348128	7337048	2722280
copter2.kp	18010432	19345989	42839131	14132982	36211025	17723567
crankseg_1.rsa	44392447	42509041	80943564	38857027	73046551	48130933
crankseg_2.rsa	65034133	67524820	112956210	58641898	102837050	65597941
crplat2.PSE	3666546	2964490	6754386	2868538	4308538	3364786
ct20stif.PSA	13045074	12536292	95844377	11449220	56012996	12939946
CVXBQP1.rsa	5375688	6018010	38725436	4141288	16599719	4259239
Fcondp2.PSE	58394154	58672074	508193145	47461422	324663546	54911766
finan512.RSA	6322943	8980810	13637262	4318376	8946552	8262480
finance256.kp	3450444	3647016	7219006	2072826	5123699	3355104
ford1.kp	320027	418321	2744479	308679	1881281	337839
ford2.kp	2717505	3196326	46213678	2349485	27901724	2807303
Fullb.PSE	93776914	95579676	410152018	87772341	336561834	96335646
gearbox.PSA	53487367	51019246	143065365	47925678	139208884	60070353
GRIDGENA.rsa	2987882	3332974	13074387	2814892	10426777	3251326
gupta1.PSA	2021303	3294996	217768353	2056311	—	2059076
gupta2.PSA	—	12259519	—	5889974	—	—
gupta3.PSA	5720806	6080928	16039358	5717930	—	5735932
Halfb.PSE	74330664	71238677	369119276	63495008	295979269	70545065
hood.rsa	29487927	27993203	179141060	26733049	151196214	27278222
inline_1.rsa	254405969	248643327	—	219283576	748618532	256428319
JNLBRNG1.rsa	1149202	1289003	6256767	1002598	5693072	1156530
ldoor.rsa	167120036	164981278	—	154824782	—	159699548
MINSURFO.rsa	1128491	1273897	6444377	986665	5861900	1200997
msc10848.RSA	2135706	2199678	6938145	2019102	4694358	2215167
msc23052.RSA	2884132	2824630	12548324	2672545	11098962	2923104
M_T1.rsa	35483112	37397448	130852566	31540518	89682957	40168089
nasasrb.RSA	13743279	14055308	20251184	11801342	19060667	14541336
OBSTCLAE.rsa	1180869	1391011	6177218	949727	5529086	1160844
OILPAN.rsa	10748521	8807820	40470031	10043754	30462366	6392953
onera_dual.kp	13485175	14668100	95771937	11135566	47915636	13316801
opt1.PSE	5821546	5821039	7777033	5244170	7244167	6015540

Table 2.2.9: Number of reals used for factors (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
pds10.kp	1703809	2061028	10386283	1603897	10376935	1687859
pkustk01.PSA	2073903	2053779	9066348	1950306	7914948	2070132
pkustk02.PSA	1364760	1331064	8051076	1301760	3402432	1340100
pkustk03.PSA	9339360	9402108	64184796	8777112	41584082	9339972
pkustk04.PSA	12099333	11965665	80626734	10530165	55085264	12518607
pkustk05.PSA	15513270	15339138	41605056	14093682	22348308	15888678
pkustk06.PSA	18402246	18684810	44893368	16941186	39239430	20929518
pkustk07.PSA	13755228	12762267	22074867	10931415	17025417	11695902
pkustk08.PSA	19273737	18565230	28700811	16454352	27118059	19727886
pkustk09.PSA	5572536	5901072	17793756	5315820	15803670	6154188
pkustk10.PSA	20360898	19171278	100051956	18073854	111170556	20902230
pkustk11.PSA	49164030	47327346	147507372	43181298	125225670	48781602
pkustk12.PSA	16450686	15177521	168744085	13236911	153429669	14452714
pkustk13.PSA	39402896	42580446	156470805	37198835	117234447	39717852
pkustk14.PSA	136859701	137748179	213084267	123880513	175422021	149452607
pwt.RSA	1810688	1820205	6059131	1562848	5244491	1995185
pwtk.RSA	70305608	66573635	198453830	56936761	174384446	80198365
ramage02.PSE	21067855	21949700	22427667	19320199	20996333	18698510
s3dkq4m2.rsa	24509801	22743209	55812719	19470377	55706014	33728803
s3dkt3m2.rsa	20404778	20409128	44843063	16051262	43401959	23241712
SHIPSEC1.rsa	41874339	41476611	324366084	39355023	227984007	48244854
SHIPSEC5.rsa	54741215	56252200	271674747	52162067	216934236	62840529
SHIPSEC8.rsa	49100211	50450094	257608431	42349323	188765680	55631394
SHIP_001.rse	16555273	17115379	16858172	15377488	15247018	18927942
SHIP_003.rsa	84767565	83078463	197554378	78790437	150242695	102337194
shuttle.eddy.PSA	404398	382586	788373	325649	684765	461141
skirt.PSA	497449	556182	924840	480826	801073	521780
Srb1.PSE	11020746	11003322	18543456	9928218	17085414	12644418
struct3.PSA	5362659	5465802	13786706	4989510	14493569	6145447
tandem_dual.kp	13454259	13942001	72062871	11492187	44632384	13146347
tandem_vtx.kp	2957410	3010700	7030980	2647866	5476959	3283600
THREAD.rsa	30751263	30454140	57601071	26407809	32171373	34806389
TORSION1.rsa	1180869	1391011	6177218	949727	5529086	1160844
trdheim.PSE	1878747	1908411	3400668	1709871	2264955	1942179
Troll.PSE	117334143	129617748	–	91754685	736661160	129345138
tsyl201.PSE	6908541	6785097	10916181	6436527	10177926	7065546
vanbody.rsa	6085197	5942882	40329942	5490550	25916391	6459970
wathen100.mat	1818911	1636836	6655000	1427594	6881032	2697219
wathen120.mat	2282697	2021159	7874271	1774509	8168481	3436133
X104.rsa	26665176	26367924	125812656	23430108	89945220	24379090

Table 2.2.10: Total number of integers used

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	1629531	3258948	90660	1674809	18589222	3802918
audikw_1.rsa	–	–	–	–	–	–
barth5.kp	123981	122968	31212	130212	360885	474756

Table 2.2.10: Total number of integers used (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
bcsstk25.RSA	209961	267680	30878	206117	1142261	679362
bcsstk29.PSA	316754	633480	27984	330743	2089384	1125171
bcsstk30.PSA	1036245	2072416	57848	1065137	3889448	2419514
bcsstk31.PSA	608526	1217004	71176	644095	3862921	1644070
bcsstk32.PSA	1029842	2059310	89218	1074284	5784512	2594628
bcsstk36.RSA	583129	1166192	46104	606153	3057734	1442826
bmw7st.1.rsa	3740565	7481014	282694	3881860	20293507	9177188
bmwcra.1.rsa	5396443	10792772	297540	5545161	58394944	12578022
bodyy4.RSA	145976	139484	35092	152718	398855	543784
bodyy5.RSA	155597	147870	37178	163316	415997	571109
bodyy6.RSA	163035	154114	38732	170799	427726	597835
cfid1.RSA	1490739	1899020	141312	1452167	10500883	10419575
cfid2.RSA	2121369	3211338	246880	2048848	18727971	16387291
copter1.kp	240207	228286	34444	242383	1212047	1122016
copter2.kp	857460	815428	110952	866219	3627355	3897168
crankseg.1.rsa	5333571	10667014	105608	5386316	46622541	11300672
crankseg.2.rsa	7106459	14212696	127676	7170191	63910201	14978762
crplat2.PSE	489535	978956	36020	507493	237281	1195086
ct20stif.PSA	1375429	2750792	104658	1427730	8267581	3378750
CVXBQP1.rsa	508195	499968	100000	519658	1430240	1549847
Fcondp2.PSE	5748126	11496138	403644	5949896	2834288	13918012
finan512.RSA	869684	671744	149504	670430	1709572	2426891
finance256.kp	437839	335872	74752	344796	854788	1213451
ford1.kp	133580	120304	37456	147055	568432	474773
ford2.kp	748781	644884	200392	814796	3155512	2629223
Fullb.PSE	5953671	11907264	398374	6152824	3984256	14297518
gearbox.PSA	4617114	9234150	307492	4770826	37446160	11079112
GRIDGENA.rsa	505671	658970	97924	531467	2222799	1917696
gupta1.PSA	1912957	2196012	63604	1999930	–	5008465
gupta2.PSA	–	4310350	–	5023260	–	–
gupta3.PSA	4672742	9340210	33566	4706536	–	23319422
Halfb.PSE	6306276	12612438	449234	6530841	4426186	15307852
hood.rsa	5494541	10988978	441084	5715036	20565680	13635492
inline_1.rsa	18660087	37320054	–	19163744	144778647	43364608
JNLBRNG1.rsa	299960	319200	80000	325482	1391612	1112494
ldoor.rsa	23737377	47474678	–	24689547	–	58901124
MINSURFO.rsa	305227	326036	81612	331180	1416838	1147136
msc10848.RSA	620376	1240626	21696	631166	2680114	1370812
msc23052.RSA	588990	1177866	46104	611990	2832421	1454500
M_T1.rsa	4925655	9851148	195156	5023157	923711	11022094
nasasrb.RSA	1366167	2732194	109740	1421013	9606969	3390644
OBSTCLAE.rsa	299072	317600	80000	319579	1379720	1099719
OILPAN.rsa	1835508	3670940	147504	1909227	11857705	4555974
onera_dual.kp	898335	532349	171134	921927	2902869	3520208
opt1.PSE	973208	1946104	30898	988506	177305	2131502
pds10.kp	397053	201857	33116	405435	1680476	2030836
pkustk01.PSA	500745	1001424	44088	522761	2717520	1265962
pkustk02.PSA	410457	820800	21600	421205	1450704	950410

Table 2.2.10: Total number of integers used (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
pkustk03.PSA	1596933	3193752	126672	1660217	7793548	3953794
pkustk04.PSA	2137191	4274250	111180	2192720	10826880	4941340
pkustk05.PSA	1121193	2242308	74328	1158323	8491070	2688286
pkustk06.PSA	1307505	2614932	86328	1350635	9953811	3132910
pkustk07.PSA	1217898	2435664	33720	1234697	6875449	2637994
pkustk08.PSA	1624506	3248880	44418	1646654	9771604	3515398
pkustk09.PSA	808857	1617600	67920	842765	3904243	2025130
pkustk10.PSA	2194887	4389660	161352	2275511	11276940	5357782
pkustk11.PSA	2652879	5305716	175608	2740667	19670165	6359374
pkustk12.PSA	3803548	7606970	189306	3898143	13806406	8742816
pkustk13.PSA	3355920	6711720	189786	3450758	21709538	7850446
pkustk14.PSA	7494371	14988430	303852	7646146	53782945	16811552
pwt.RSA	328445	362626	73038	334616	1585174	1401516
pwtk.RSA	5926228	11852342	435836	6144094	36667029	14467368
ramage02.PSE	1441765	2883182	33660	1458426	259951	3085152
s3dkq4m2.rsa	2455727	4911340	180898	2546124	15197218	9106871
s3dkt3m2.rsa	1922000	3843910	180898	2012409	6707153	4929308
SHIPSEC1.rsa	3977196	7954278	281748	4118018	2667140	11835938
SHIPSEC5.rsa	5146517	10292956	359720	5326343	3429542	16173797
SHIPSEC8.rsa	3384216	6768318	229838	3499083	2327796	11202287
SHIP_001.rse	2339656	4679150	69840	2374500	507792	5177730
SHIP_003.rsa	4103920	8207762	243456	4225614	3143758	18209869
shuttle_eddy.PSA	90474	114028	20858	92368	461289	405956
skirt.PSA	117791	209118	25196	120245	835957	549418
Srb1.PSE	1508595	3017076	109848	1563467	730617	3676174
struct3.PSA	639649	1227264	107140	667285	5486934	2678091
tandem_dual.kp	980361	572255	188138	1014471	3179276	3931319
tandem_vtx.kp	263783	271804	36908	265804	1094987	1200869
THREAD.rsa	2250048	4499784	59472	2279633	414191	4856626
TORSION1.rsa	299072	317600	80000	319579	1379720	1099719
trdheim.PSE	978768	1957422	44196	1000814	167578	2222608
Troll.PSE	6099339	12198564	–	6312740	3332400	14760010
tsyl201.PSE	1237920	2475642	41370	1258511	193472	2723872
vanbody.rsa	1192046	2383970	94144	1239062	6648228	2948844
wathen100.mat	251715	502002	60802	281435	1235281	1539842
wathen120.mat	302017	602202	72882	337575	1439065	1848822
X104.rsa	5138085	10276008	216768	5246393	1008658	11576626

Table 2.2.11: Total number of reals used

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	34390354	42403678	8167521	34424911	5998085	40710831
audikw_1.rsa	–	–	–	–	–	–
barth5.kp	417310	514754	516552	401675	24658	469721
bcsstk25.RSA	1820567	2156884	286166	1695811	64153	2355807
bcsstk29.PSA	2053285	2355786	4774413	2205206	101653	2774977
bcsstk30.PSA	4807120	5460009	12214510	4301826	295973	6228075
bcsstk31.PSA	6750606	9315255	1531748	6508897	754000	11292281

Table 2.2.11: Total number of reals used (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
bcsstk32.PSA	6148236	7256019	17784977	5530490	1020553	6781275
bcsstk36.RSA	3194892	4007773	9962917	3411414	364185	3906641
bmw7st_1.rsa	30366709	36350859	221850081	31052801	2707321	41096398
bmwcra_1.rsa	114330523	129413606	28575466	108745632	6770980	136129658
bodyy4.RSA	675383	866873	457860	700933	35353	837443
bodyy5.RSA	702661	876029	460088	727056	39610	891009
bodyy6.RSA	760906	962086	749247	792256	38818	969654
cf1.RSA	51564648	59564803	23213503	45790977	2739146	81877320
cf2.RSA	108524731	130328454	20509692	84008847	2683125	181733292
copter1.kp	3237046	4565350	3419703	3837854	461057	5467112
copter2.kp	20107949	30649328	16587743	18391275	913952	26272687
crankseg_1.rsa	47926114	50928911	35114890	46936754	5134858	62426145
crankseg_2.rsa	69109712	87404945	39310863	72394968	11540261	84786961
crplat2.PSE	4076908	4017657	2552572	3822670	127312	5358798
ct20stif.PSA	15961314	19255287	79446732	18607959	3368825	22414258
CVXBQP1.rsa	6844070	13514155	5500828	8068030	231377	9048759
Fcondp2.PSE	63208795	72873973	385215249	59997726	8451225	76108334
finan512.RSA	8325720	21662831	823221	8364763	72936	29825238
finance256.kp	6441341	7578457	1854461	2947447	69732	8678726
ford1.kp	334543	485140	388671	346921	31826	390659
ford2.kp	2853590	3785091	4269670	2620531	228258	3440123
Fullb.PSE	110974106	159199438	103447636	133407825	5546601	163256534
gearbox.PSA	57619249	64785737	99577114	58262487	6146017	86026373
GRIDGENA.rsa	3073654	3700263	2520870	3078986	112274	3608346
gupta1.PSA	9627630	5206995	217633157	15049738	–	3992227
gupta2.PSA	–	32583740	–	50817184	–	–
gupta3.PSA	13009168	17773956	16284496	38361544	–	18580949
Halfb.PSE	86778010	94655820	78906689	78632981	3968640	102393253
hood.rsa	30374758	30242614	43327256	28516579	1595610	30233110
inline_1.rsa	261640641	275725615	–	238499112	9848340	298353651
JNLBRNG1.rsa	1217939	1618918	171385	1130744	79600	1491918
ldoor.rsa	171921967	185434205	–	170523831	–	182839960
MINSURFO.rsa	1187452	1600909	178291	1124556	81002	1625125
msc10848.RSA	2354479	2969242	5133201	2522517	767476	3079787
msc23052.RSA	3137717	3557248	12016619	3317676	766201	3854724
M_T1.rsa	36928606	45999604	86401269	36518781	2094516	49529561
nasasrb.RSA	14320076	16434027	3683757	12689200	376210	17815584
OBSTCLAE.rsa	1238522	1634777	158192	1086458	78808	1561364
OILPAN.rsa	11381952	10973230	12027750	11693577	421642	8113473
onera_dual.kp	16916422	25435586	38643807	19169985	1108818	25170389
opt1.PSE	6767955	9071919	3316481	7702363	621396	11106788
pds10.kp	3984660	6695157	10264426	6176414	1923778	4293911
pkustk01.PSA	2233909	2612674	6195246	2358312	301977	2791340
pkustk02.PSA	1479439	1770607	7039368	1740063	307684	1963952
pkustk03.PSA	9870328	11492941	49106292	10845678	1158401	11496944
pkustk04.PSA	14971834	20208580	68118879	14719809	5866425	23728727
pkustk05.PSA	18559894	27706048	36489948	21504864	1184644	28715798
pkustk06.PSA	21190363	31426900	22565952	26026488	2215044	40106150

Table 2.2.11: Total number of reals used (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
pkustk07.PSA	18840610	26695768	18294414	19788465	1408194	23774522
pkustk08.PSA	24169969	38515441	5657511	27750252	1900098	45439514
pkustk09.PSA	5983579	7634923	7247040	6379332	403801	8311160
pkustk10.PSA	21702454	22867050	99048888	21181515	3133476	26712878
pkustk11.PSA	56372626	72923401	106424280	59867400	4701520	85085330
pkustk12.PSA	18676287	22743001	164221915	17431785	23101357	19973886
pkustk13.PSA	42881292	60020125	60317121	51075989	4911952	57365600
pkustk14.PSA	144786131	171549414	120294481	140215687	7186000	181061815
pwt.RSA	1857541	1973604	464243	1665153	71368	2266777
pwtk.RSA	72823132	74954973	46877637	62545108	1535697	92385357
ramage02.PSE	28031057	47801475	6194095	39307693	2127473	40458722
s3dkq4m2.rsa	26515149	29267850	7898204	23694692	397261	41853291
s3dkt3m2.rsa	21853263	24539652	792701	17802050	389545	28532724
SHIPSEC1.rsa	48051454	59569141	212029068	51370707	5905476	68526942
SHIPSEC5.rsa	60091551	75745088	60426467	66436982	3663972	87137957
SHIPSEC8.rsa	62251831	86813621	182897276	61016640	9175417	92792222
SHIP_001.rse	17797841	22117895	1437561	19825345	482553	24684174
SHIP_003.rsa	94634293	119282467	62932200	101535315	3992580	151908126
shuttle.eddy.PSA	424871	414600	102586	349161	20111	538373
skirt.PSA	500027	621984	236257	528309	45860	612952
Srb1.PSE	11537431	12492655	2730396	10610271	311940	14801390
struct3.PSA	5562395	5856905	2063858	5287825	175682	7209795
tandem_dual.kp	15005118	18902436	20736175	16698152	403241	18010435
tandem_vtx.kp	3299491	4173015	3291172	3591843	165674	5750028
THREAD.rsa	38525071	52058247	56731410	39793188	1866825	62804041
TORSION1.rsa	1238522	1634777	158192	1086458	78808	1561364
trdheim.PSE	1933153	2053699	698352	1816263	100260	2160647
Troll.PSE	129792772	211643038	—	131799813	45401220	195160010
tsyl201.PSE	7684075	10049818	2329692	9016197	492201	10926974
vanbody.rsa	6351496	6834022	26999904	6286326	803941	7968562
wathen100.mat	1937933	2026428	2144243	1621946	99289	3588339
wathen120.mat	2404801	2441949	2134711	2021147	99289	4483045
X104.rsa	29648431	36277159	96045312	26861211	3781440	31817328

Table 2.2.12: Norm of scaled residuals

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	1.4E-15	6.5E-16	5.2E-16	6.3E-16	3.1E-16	6.9E-16
audikw_1.rsa	—	—	—	—	—	—
barth5.kp	2.8E-16	2.3E-16	2.5E-16	2.6E-16	2.2E-16	2.8E-16
bcsstk25.RSA	1.9E-16	1.7E-16	3.8E-16	1.6E-16	2.4E-16	1.5E-16
bcsstk29.PSA	6.3E-16	3.1E-16	3.1E-16	3.3E-16	3.2E-16	3.7E-16
bcsstk30.PSA	8.0E-16	4.2E-16	4.7E-16	3.9E-16	5.0E-16	4.3E-16
bcsstk31.PSA	6.3E-16	3.2E-16	3.3E-16	3.5E-16	3.5E-16	3.8E-16
bcsstk32.PSA	6.6E-16	3.2E-16	3.6E-16	3.1E-16	3.5E-16	3.4E-16
bcsstk36.RSA	6.3E-16	3.8E-16	9.0E-16	3.7E-16	5.5E-16	3.6E-16
bmw7st_1.rsa	1.6E-16	9.4E-17	2.7E-16	4.7E-16	1.0E-15	2.1E-16
bmwcra_1.rsa	9.7E-15	6.5E-15	6.4E-15	4.2E-15	5.9E-15	6.2E-15

Table 2.2.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
bodyy4.RSA	1.5E-16	1.3E-16	1.5E-16	1.4E-16	1.4E-16	1.4E-16
bodyy5.RSA	1.4E-16	1.2E-16	1.4E-16	1.3E-16	1.5E-16	1.3E-16
bodyy6.RSA	1.2E-16	1.1E-16	1.4E-16	1.2E-16	1.3E-16	1.2E-16
cf1.RSA	3.1E-15	2.2E-15	4.3E-15	1.4E-15	1.6E-15	2.1E-15
cf2.RSA	1.7E-15	1.4E-15	1.0E-15	6.7E-16	1.0E-15	1.0E-15
copter1.kp	6.2E-16	3.1E-16	4.8E-16	3.4E-16	2.2E-16	3.7E-16
copter2.kp	7.8E-16	3.7E-16	5.0E-16	3.7E-16	3.0E-16	4.3E-16
crankseg_1.rsa	6.5E-16	4.2E-17	7.2E-16	9.0E-16	1.2E-15	2.3E-16
crankseg_2.rsa	2.1E-15	4.4E-17	4.8E-15	4.3E-16	2.7E-16	4.4E-16
crplat2.PSE	7.2E-16	3.5E-16	3.2E-16	3.4E-16	3.8E-16	3.6E-16
ct20stif.PSA	8.6E-16	4.0E-16	4.8E-16	4.0E-16	4.2E-16	4.2E-16
CVXBQP1.rsa	3.0E-16	1.7E-16	5.1E-16	1.6E-16	2.1E-16	1.5E-16
Fcondp2.PSE	7.7E-16	3.7E-16	4.0E-16	3.5E-16	4.1E-16	3.7E-16
finan512.RSA	7.2E-16	3.8E-16	7.3E-16	4.0E-16	2.7E-16	5.9E-16
finance256.kp	3.0E-16	2.2E-16	3.5E-16	2.4E-16	2.2E-16	2.9E-16
ford1.kp	2.3E-16	2.0E-16	2.4E-16	2.2E-16	1.9E-16	2.4E-16
ford2.kp	2.4E-16	2.0E-16	2.5E-16	2.2E-16	2.0E-16	2.4E-16
Fullb.PSE	9.1E-16	4.1E-16	4.0E-16	3.9E-16	4.8E-16	4.1E-16
gearbox.PSA	9.8E-16	4.3E-16	4.1E-16	4.4E-16	3.4E-16	5.0E-16
GRIDGENA.rsa	2.1E-14	1.6E-14	3.0E-14	1.5E-14	2.2E-14	1.7E-14
gupta1.PSA	4.4E-15	2.9E-15	6.1E-15	4.1E-15	—	8.5E-15
gupta2.PSA	—	3.0E-15	—	4.6E-15	—	—
gupta3.PSA	1.7E-15	9.9E-16	1.4E-15	1.4E-15	—	1.5E-15
Halfb.PSE	7.8E-16	3.7E-16	3.7E-16	3.5E-16	4.7E-16	3.7E-16
hood.rsa	6.6E-16	4.8E-16	5.6E-16	4.8E-16	4.9E-16	4.8E-16
inline_1.rsa	2.2E-15	9.9E-16	—	8.0E-16	9.5E-16	1.1E-15
JNLBRNG1.rsa	6.3E-15	5.6E-15	7.1E-15	5.8E-15	6.9E-15	6.1E-15
ldoor.rsa	7.1E-16	2.8E-16	—	2.6E-16	—	2.9E-16
MINSURFO.rsa	3.4E-15	2.8E-15	3.1E-15	2.8E-15	3.2E-15	3.2E-15
msc10848.RSA	4.5E-16	2.0E-16	8.5E-16	1.7E-16	5.2E-16	2.4E-16
msc23052.RSA	6.3E-16	3.9E-16	9.3E-16	3.9E-16	5.3E-16	3.9E-16
M_T1.rsa	5.9E-16	3.5E-16	5.8E-16	3.1E-16	4.7E-16	3.3E-16
nasasrb.RSA	6.7E-16	3.9E-16	4.7E-16	3.4E-16	5.0E-16	3.7E-16
OBSTCLAE.rsa	3.2E-15	2.4E-15	2.9E-15	2.3E-15	3.2E-15	2.5E-15
OILPAN.rsa	3.9E-16	2.3E-16	4.6E-16	2.2E-16	3.5E-16	2.2E-16
onera_dual.kp	2.7E-16	2.1E-16	2.7E-16	2.3E-16	2.1E-16	2.5E-16
opt1.PSE	1.2E-15	6.6E-16	4.9E-16	5.9E-16	5.2E-16	6.4E-16
pds10.kp	5.8E-16	3.7E-16	5.5E-16	4.0E-16	2.9E-16	4.7E-16
pkustk01.PSA	6.1E-16	3.2E-16	3.6E-16	3.0E-16	3.3E-16	3.2E-16
pkustk02.PSA	6.6E-16	3.9E-16	4.2E-16	3.7E-16	5.9E-16	3.9E-16
pkustk03.PSA	6.5E-16	3.1E-16	3.2E-16	3.0E-16	3.6E-16	3.1E-16
pkustk04.PSA	1.1E-15	7.3E-16	6.5E-16	6.9E-16	5.8E-16	6.8E-16
pkustk05.PSA	1.1E-15	4.6E-16	4.4E-16	4.2E-16	3.4E-16	4.6E-16
pkustk06.PSA	1.1E-15	4.8E-16	4.4E-16	4.2E-16	3.8E-16	4.6E-16
pkustk07.PSA	1.5E-15	1.0E-15	6.7E-16	6.9E-16	6.8E-16	8.0E-16
pkustk08.PSA	1.6E-15	1.1E-15	6.5E-16	6.8E-16	6.8E-16	9.0E-16
pkustk09.PSA	6.7E-16	3.1E-16	3.1E-16	3.0E-16	3.5E-16	3.2E-16
pkustk10.PSA	7.7E-16	3.2E-16	3.1E-16	3.1E-16	3.4E-16	3.4E-16

Table 2.2.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
pkustk11.PSA	1.1E-15	4.8E-16	4.3E-16	4.3E-16	3.5E-16	4.7E-16
pkustk12.PSA	1.3E-15	8.0E-16	7.5E-16	7.8E-16	6.3E-16	8.2E-16
pkustk13.PSA	1.1E-15	5.0E-16	5.4E-16	5.1E-16	4.2E-16	5.4E-16
pkustk14.PSA	1.7E-15	7.7E-16	7.0E-16	5.9E-16	5.4E-16	7.3E-16
pwt.RSA	3.2E-16	2.4E-16	2.5E-16	2.7E-16	2.0E-16	2.9E-16
pwtk.RSA	1.1E-15	6.8E-16	8.0E-16	5.5E-16	8.2E-16	6.1E-16
ramage02.PSE	1.9E-15	1.4E-15	6.1E-16	9.4E-16	6.3E-16	9.3E-16
s3dkq4m2.rsa	7.1E-15	5.5E-15	5.0E-15	4.1E-15	6.4E-15	5.5E-15
s3dkt3m2.rsa	7.8E-15	6.0E-15	5.8E-15	4.6E-15	7.7E-15	5.8E-15
SHIPSEC1.rsa	1.8E-15	7.0E-16	4.8E-15	4.7E-16	6.2E-16	7.3E-16
SHIPSEC5.rsa	1.8E-15	1.3E-15	2.6E-15	7.0E-16	9.3E-16	1.1E-15
SHIPSEC8.rsa	1.6E-15	8.6E-16	2.4E-15	5.0E-16	1.4E-15	7.9E-16
SHIP_001.rse	1.2E-15	7.8E-16	5.9E-16	5.6E-16	5.2E-16	8.5E-16
SHIP_003.rsa	1.8E-15	3.1E-15	2.3E-15	1.1E-15	2.0E-15	1.6E-15
shuttle.eddy.PS	3.3E-16	2.4E-16	2.6E-16	2.8E-16	2.2E-16	2.9E-16
skirt.PSA	4.1E-16	2.6E-16	2.9E-16	2.9E-16	2.4E-16	3.2E-16
Srb1.PSE	7.5E-16	3.5E-16	3.0E-16	3.4E-16	3.5E-16	3.7E-16
struct3.PSA	5.1E-16	2.8E-16	2.7E-16	3.3E-16	2.6E-16	3.6E-16
tandem_dual.kp	2.8E-16	2.1E-16	2.7E-16	2.3E-16	2.1E-16	2.6E-16
tandem_vtx.kp	7.0E-16	3.4E-16	4.6E-16	3.6E-16	2.8E-16	4.2E-16
THREAD.rsa	1.2E-14	3.3E-15	4.3E-15	2.9E-15	3.5E-15	3.3E-15
TORSION1.rsa	3.2E-15	2.4E-15	2.9E-15	2.3E-15	3.2E-15	2.5E-15
trdheim.PSE	6.7E-16	4.4E-16	4.0E-16	4.3E-16	3.9E-16	4.4E-16
Troll.PSE	1.0E-15	4.4E-16	–	4.2E-16	4.5E-16	4.6E-16
tsyl201.PSE	1.1E-15	5.8E-16	4.8E-16	5.3E-16	4.6E-16	5.4E-16
vanbody.rsa	4.6E-16	2.9E-16	7.7E-16	2.8E-16	4.1E-16	4.8E-16
wathen100.mat	2.3E-16	1.6E-16	2.7E-16	1.8E-16	2.0E-16	1.9E-16
wathen120.mat	2.3E-16	1.6E-16	2.7E-16	1.8E-16	2.0E-16	1.9E-16
X104.rsa	7.0E-15	6.1E-15	1.3E-14	3.2E-15	3.6E-15	5.5E-15

Table 2.2.13: Norm of scaled residuals following a single refinement

Name	MA27	MA47	MA55	MA57	MA62	MA67
3dtube.PSA	1.6E-16	1.2E-16	1.2E-16	1.2E-16	1.6E-16	1.3E-16
audikw_1.rsa	–	–	–	–	–	–
barth5.kp	9.6E-17	9.3E-17	8.6E-17	9.5E-17	1.0E-16	9.6E-17
bcsstk25.RSA	1.1E-16	9.7E-17	1.5E-16	1.3E-16	1.7E-16	1.8E-16
bcsstk29.PSA	1.0E-16	8.5E-17	8.7E-17	8.6E-17	1.0E-16	8.9E-17
bcsstk30.PSA	1.4E-16	1.1E-16	1.2E-16	1.1E-16	1.3E-16	1.1E-16
bcsstk31.PSA	9.9E-17	8.6E-17	8.8E-17	8.7E-17	1.0E-16	8.9E-17
bcsstk32.PSA	1.1E-16	8.6E-17	8.9E-17	8.6E-17	1.1E-16	8.7E-17
bcsstk36.RSA	3.3E-16	3.1E-16	3.3E-16	3.1E-16	3.2E-16	3.3E-16
bmw7st_1.rsa	7.1E-17	3.1E-16	2.9E-16	1.9E-16	9.2E-17	8.7E-17
bmwcra_1.rsa	3.0E-15	3.0E-15	2.5E-15	3.0E-15	3.5E-15	3.0E-15
bodyy4.RSA	7.0E-17	7.2E-17	7.1E-17	6.9E-17	9.0E-17	7.3E-17
bodyy5.RSA	6.9E-17	7.1E-17	7.1E-17	7.1E-17	9.3E-17	6.9E-17
bodyy6.RSA	7.4E-17	6.9E-17	6.9E-17	7.0E-17	8.4E-17	7.3E-17

Table 2.2.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
cf1.RSA	7.3E-16	7.4E-16	7.7E-16	7.3E-16	8.2E-16	7.2E-16
cf2.RSA	4.1E-16	4.1E-16	4.0E-16	4.2E-16	4.7E-16	4.1E-16
copter1.kp	1.1E-16	9.7E-17	8.8E-17	1.0E-16	7.3E-17	1.0E-16
copter2.kp	1.1E-16	1.0E-16	9.0E-17	1.0E-16	8.9E-17	1.0E-16
crankseg_1.rsa	2.4E-16	1.0E-16	2.4E-15	1.3E-15	1.6E-15	1.8E-16
crankseg_2.rsa	3.7E-16	5.1E-17	1.7E-15	1.7E-16	7.2E-17	5.1E-16
crplat2.PSE	1.3E-16	1.1E-16	8.8E-17	1.1E-16	1.2E-16	1.1E-16
ct20stif.PSA	1.2E-16	9.4E-17	9.9E-17	9.5E-17	1.2E-16	9.7E-17
CVXBQP1.rsa	1.2E-16	1.2E-16	1.1E-16	1.2E-16	1.3E-16	1.2E-16
Fcondp2.PSE	1.4E-16	1.1E-16	9.4E-17	1.1E-16	1.2E-16	1.1E-16
finan512.RSA	1.4E-16	1.3E-16	1.7E-16	1.3E-16	1.5E-16	1.4E-16
finance256.kp	9.5E-17	9.2E-17	8.4E-17	9.4E-17	8.7E-17	9.5E-17
ford1.kp	9.1E-17	8.8E-17	8.2E-17	9.1E-17	1.0E-16	9.1E-17
ford2.kp	9.2E-17	8.9E-17	8.3E-17	9.1E-17	1.0E-16	9.2E-17
Fullb.PSE	1.5E-16	1.1E-16	9.7E-17	1.1E-16	1.1E-16	1.1E-16
gearbox.PSA	1.3E-16	1.0E-16	1.0E-16	1.0E-16	1.1E-16	1.1E-16
GRIDGENA.rsa	1.1E-14	1.1E-14	8.7E-15	1.1E-14	8.7E-15	1.1E-14
gupta1.PSA	7.5E-17	6.9E-17	1.0E-16	6.7E-17	–	6.7E-16
gupta2.PSA	–	7.5E-17	–	7.2E-17	–	–
gupta3.PSA	1.1E-16	9.3E-17	1.3E-16	1.0E-16	–	1.0E-16
Halfb.PSE	1.3E-16	1.1E-16	9.3E-17	1.1E-16	1.1E-16	1.1E-16
hood.rsa	5.8E-16	5.7E-16	2.8E-16	5.7E-16	2.7E-16	5.8E-16
inline_1.rsa	1.0E-15	9.4E-16	–	1.1E-15	6.9E-16	1.3E-15
JNLBRNG1.rsa	4.7E-15	4.8E-15	4.2E-15	4.8E-15	4.3E-15	4.7E-15
ldoor.rsa	2.8E-16	2.7E-16	–	2.7E-16	–	2.8E-16
MINSURFO.rsa	2.1E-15	2.2E-15	1.8E-15	2.1E-15	2.0E-15	2.1E-15
msc10848.RSA	9.5E-17	1.4E-16	1.2E-15	1.2E-16	5.7E-16	1.4E-16
msc23052.RSA	3.6E-16	3.7E-16	3.3E-16	3.5E-16	3.5E-16	3.7E-16
M_T1.rsa	3.4E-16	3.3E-16	3.1E-16	3.2E-16	3.0E-16	3.4E-16
nasasrb.RSA	2.8E-16	3.0E-16	3.1E-16	3.0E-16	3.3E-16	2.8E-16
OBSTCLAE.rsa	1.9E-15	1.9E-15	1.7E-15	1.9E-15	1.9E-15	1.9E-15
OILPAN.rsa	2.2E-16	2.2E-16	2.3E-16	2.2E-16	2.3E-16	2.2E-16
onera_dual.kp	9.1E-17	8.9E-17	8.3E-17	9.1E-17	1.1E-16	9.1E-17
opt1.PSE	2.4E-16	1.9E-16	1.4E-16	1.8E-16	1.4E-16	1.8E-16
pds10.kp	1.0E-16	9.8E-17	8.5E-17	9.9E-17	9.2E-17	1.0E-16
pkustk01.PSA	1.0E-16	8.7E-17	9.3E-17	8.5E-17	1.1E-16	8.7E-17
pkustk02.PSA	1.3E-16	1.0E-16	1.1E-16	1.0E-16	1.4E-16	1.0E-16
pkustk03.PSA	1.1E-16	8.6E-17	8.7E-17	8.4E-17	1.1E-16	8.5E-17
pkustk04.PSA	1.5E-16	1.2E-16	1.2E-16	1.2E-16	1.5E-16	1.2E-16
pkustk05.PSA	1.4E-16	1.0E-16	1.1E-16	1.0E-16	1.3E-16	1.0E-16
pkustk06.PSA	1.4E-16	1.0E-16	1.1E-16	1.0E-16	1.3E-16	1.0E-16
pkustk07.PSA	2.4E-16	1.8E-16	1.7E-16	1.7E-16	2.1E-16	1.8E-16
pkustk08.PSA	2.4E-16	1.9E-16	1.7E-16	1.7E-16	2.1E-16	1.8E-16
pkustk09.PSA	1.1E-16	8.5E-17	8.7E-17	8.5E-17	1.1E-16	8.5E-17
pkustk10.PSA	1.1E-16	8.7E-17	8.7E-17	8.6E-17	1.1E-16	8.6E-17
pkustk11.PSA	1.4E-16	1.0E-16	1.1E-16	1.0E-16	1.3E-16	1.0E-16
pkustk12.PSA	1.7E-16	1.3E-16	1.3E-16	1.3E-16	1.8E-16	1.4E-16
pkustk13.PSA	1.5E-16	1.1E-16	1.2E-16	1.1E-16	1.3E-16	1.2E-16

Table 2.2.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA55	MA57	MA62	MA67
pkustk14.PSA	2.2E-16	1.5E-16	1.5E-16	1.4E-16	1.8E-16	1.5E-16
pwt.RSA	8.6E-17	8.4E-17	8.7E-17	8.5E-17	9.6E-17	8.5E-17
pwtk.RSA	4.3E-16	4.3E-16	4.4E-16	4.4E-16	6.0E-16	4.2E-16
ramage02.PSE	3.2E-16	2.6E-16	1.8E-16	2.3E-16	1.5E-16	2.3E-16
s3dkq4m2.rsa	3.1E-15	3.1E-15	2.8E-15	3.1E-15	4.6E-15	3.1E-15
s3dkt3m2.rsa	3.0E-15	3.0E-15	3.2E-15	3.1E-15	3.9E-15	3.0E-15
SHIPSEC1.rsa	2.3E-16	2.3E-16	2.5E-16	2.3E-16	2.2E-16	2.5E-16
SHIPSEC5.rsa	3.2E-16	3.2E-16	3.3E-16	3.3E-16	3.3E-16	3.3E-16
SHIPSEC8.rsa	2.2E-16	2.2E-16	2.3E-16	2.2E-16	2.2E-16	2.2E-16
SHIP_001.rse	4.4E-16	4.4E-16	3.7E-16	4.3E-16	2.4E-16	4.4E-16
SHIP_003.rsa	8.2E-16	7.9E-16	8.3E-16	7.8E-16	5.5E-16	8.2E-16
shuttle.eddy.PS	8.6E-17	8.3E-17	8.7E-17	8.5E-17	1.0E-16	8.5E-17
skirt.PSA	8.8E-17	8.2E-17	8.6E-17	8.5E-17	8.0E-17	8.6E-17
Srb1.PSE	1.3E-16	1.1E-16	8.6E-17	1.0E-16	1.2E-16	1.1E-16
struct3.PSA	9.0E-17	8.3E-17	8.5E-17	8.5E-17	7.6E-17	8.6E-17
tandem_dual.kp	9.1E-17	8.9E-17	8.2E-17	9.1E-17	1.1E-16	9.2E-17
tandem_vtx.kp	1.1E-16	1.0E-16	9.0E-17	1.0E-16	8.9E-17	1.0E-16
THREAD.rsa	2.2E-15	2.1E-15	2.9E-15	2.1E-15	1.5E-15	2.1E-15
TORSION1.rsa	1.9E-15	1.9E-15	1.7E-15	1.9E-15	1.9E-15	1.9E-15
trdheim.PSE	1.8E-16	1.5E-16	1.2E-16	1.5E-16	1.4E-16	1.5E-16
Troll.PSE	1.4E-16	1.1E-16	–	1.1E-16	1.2E-16	1.1E-16
tsyl201.PSE	2.3E-16	1.8E-16	1.4E-16	1.8E-16	1.5E-16	1.8E-16
vanbody.rsa	3.7E-16	4.8E-16	2.5E-16	2.7E-16	3.9E-16	1.7E-16
wathen100.mat	1.5E-16	1.5E-16	1.4E-16	1.5E-16	1.8E-16	1.5E-16
wathen120.mat	1.6E-16	1.5E-16	1.4E-16	1.6E-16	1.7E-16	1.6E-16
X104.rsa	2.0E-15	2.0E-15	2.5E-15	2.0E-15	1.4E-15	2.0E-15

2.3 MA57 option comparisons

It should be apparent from the results given in Section 2.2 that MA57 frequently significantly outperforms its competitors, at least in terms of the CPU time required. In this section, we report on further experiments which aim to improve this code by replacing the default Approximate Minimum Degree (AMD) ordering (Amestoy, Davis and Duff, 1996) used in the MA57 analysis phase with one of three alternatives.

The first possibility is to use instead the multi-level graph partitioning ordering generated by the METIS package (Karypis and Kumar, 1999). We denote this option MA57_METIS. Secondly we consider the minimum degree ordering as found by the analysis phase of MA27 (MA57_MA27). Finally, we have tried a special version (soon to be released in HSL as MC50, see Duff, 2002) of the AMD ordering, in which precautions are taken to ensure that (close to) dense rows do not dominate the local search for the approximate minimum degree (MA57_MC50).

The statistics reported in the following tables are as described in the introduction to Section 2.2. The external C package METIS was compiled with full optimization.

Table 2.3.1: Return code

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	0	0	0	0
audikw_1.rsa	-2	-2	-2	-2

Table 2.3.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
barth5.kp	0	0	0	0
bcsstk25.RSA	0	0	0	0
bcsstk29.PSA	0	0	0	0
bcsstk30.PSA	0	0	0	0
bcsstk31.PSA	0	0	0	0
bcsstk32.PSA	0	0	0	0
bcsstk36.RSA	0	0	0	0
bmw7st_1.rsa	0	0	0	0
bmwcra_1.rsa	0	0	0	0
bodyy4.RSA	0	0	0	0
bodyy5.RSA	0	0	0	0
bodyy6.RSA	0	0	0	0
cf1.RSA	0	0	0	0
cf2.RSA	0	0	0	0
copter1.kp	0	0	0	0
copter2.kp	0	0	0	0
crankseg_1.rsa	0	0	0	0
crankseg_2.rsa	0	0	0	0
crplat2.PSE	0	0	0	0
ct20stif.PSA	0	0	0	0
CVXBQP1.rsa	0	0	0	0
Fcondp2.PSE	0	0	0	0
finan512.RSA	0	0	0	0
finance256.kp	0	0	0	0
ford1.kp	0	0	0	0
ford2.kp	0	0	0	0
Fullb.PSE	0	0	0	0
gearbox.PSA	0	0	0	0
GRIDGENA.rsa	0	0	0	0
gupta1.PSA	0	0	0	0
gupta2.PSA	0	0	-99	0
gupta3.PSA	0	0	0	0
Halfb.PSE	0	0	0	0
hood.rsa	0	0	0	0
inline_1.rsa	0	0	0	0
JNLBRNG1.rsa	0	0	0	0
ldoor.rsa	0	0	0	0
MINSURFO.rsa	0	0	0	0
msc10848.RSA	0	0	0	0
msc23052.RSA	0	0	0	0
M_T1.rsa	0	0	0	0
nasasrb.RSA	0	0	0	0
OBSTCLAE.rsa	0	0	0	0
OILPAN.rsa	0	0	0	0
onera_dual.kp	0	0	0	0
opt1.PSE	0	0	0	0
pds10.kp	0	0	0	0
pkustk01.PSA	0	0	0	0

Table 2.3.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
pkustk02.PSA	0	0	0	0
pkustk03.PSA	0	0	0	0
pkustk04.PSA	0	0	0	0
pkustk05.PSA	0	0	0	0
pkustk06.PSA	0	0	0	0
pkustk07.PSA	0	0	0	0
pkustk08.PSA	0	0	0	0
pkustk09.PSA	0	0	0	0
pkustk10.PSA	0	0	0	0
pkustk11.PSA	0	0	0	0
pkustk12.PSA	0	0	0	0
pkustk13.PSA	0	0	0	0
pkustk14.PSA	0	0	0	0
pwt.RSA	0	0	0	0
pwtk.RSA	0	0	0	0
ramage02.PSE	0	0	0	0
s3dkq4m2.rsa	0	0	0	0
s3dkt3m2.rsa	0	0	0	0
SHIPSEC1.rsa	0	0	0	0
SHIPSEC5.rsa	0	0	0	0
SHIPSEC8.rsa	0	0	0	0
SHIP_001.rse	0	0	0	0
SHIP_003.rsa	0	0	0	0
shuttle_eddy.PSA	0	0	0	0
skirt.PSA	0	0	0	0
Srb1.PSE	0	0	0	0
struct3.PSA	0	0	0	0
tandem_dual.kp	0	0	0	0
tandem_vtx.kp	0	0	0	0
THREAD.rsa	0	0	0	0
TORSION1.rsa	0	0	0	0
trdheim.PSE	0	0	0	0
Troll.PSE	0	0	0	0
tsyl201.PSE	0	0	0	0
vanbody.rsa	0	0	0	0
wathen100.mat	0	0	0	0
wathen120.mat	0	0	0	0
X104.rsa	0	0	0	0

Table 2.3.2: Total time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	70.937	34.061	93.798	107.284
audikw_1.rsa	—	—	—	—
barth5.kp	0.256	0.578	0.248	0.264
bcsstk25.RSA	1.311	3.051	2.151	1.334
bcsstk29.PSA	1.527	2.858	2.993	1.536

Table 2.3.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bcsstk30.PSA	3.570	5.516	4.902	3.594
bcsstk31.PSA	7.194	6.034	9.466	7.236
bcsstk32.PSA	4.235	6.718	5.534	4.274
bcsstk36.RSA	2.366	2.948	2.684	2.380
bmw7st_1.rsa	40.708	38.082	48.948	40.828
bmwcra_1.rsa	273.179	155.845	358.073	273.290
bodyy4.RSA	0.407	0.707	0.424	0.416
bodyy5.RSA	0.434	0.758	0.439	0.444
bodyy6.RSA	0.463	0.797	0.479	0.472
cf1.RSA	101.321	44.518	160.319	101.475
cf2.RSA	219.752	83.073	416.539	219.646
copter1.kp	3.803	4.063	5.102	3.822
copter2.kp	31.560	23.433	52.087	31.695
crankseg_1.rsa	103.226	82.649	138.294	136.397
crankseg_2.rsa	196.529	109.114	239.522	257.858
crplat2.PSE	2.868	2.871	4.730	2.863
ct20stif.PSA	22.636	16.744	29.923	22.690
CVXBQP1.rsa	9.135	4.208	13.188	9.203
Fcondp2.PSE	101.953	130.894	145.767	101.578
finan512.RSA	8.330	4.253	25.351	8.318
finance256.kp	2.924	1.931	14.053	2.964
ford1.kp	0.251	0.594	0.216	0.259
ford2.kp	2.098	4.530	2.244	2.165
Fullb.PSE	409.206	345.786	486.739	409.498
gearbox.PSA	104.007	64.151	128.681	104.123
GRIDGENA.rsa	2.146	3.792	2.234	2.197
gupta1.PSA	114.422	22.280	13.428	17.641
gupta2.PSA	379.416	109.703	–	89.577
gupta3.PSA	114.926	33.855	93.346	98.655
Halfb.PSE	185.582	200.255	282.821	185.665
hood.rsa	28.904	32.256	36.679	29.051
inline_1.rsa	540.030	394.309	756.405	891.180
JNLBRNG1.rsa	0.766	1.577	0.847	0.779
ldoor.rsa	283.736	220.875	336.530	284.073
MINSURFO.rsa	0.764	1.619	0.835	0.784
msc10848.RSA	2.114	2.515	2.257	2.120
msc23052.RSA	2.286	2.882	2.634	2.297
M_T1.rsa	52.030	57.873	64.692	52.238
nasasrb.RSA	13.487	14.275	18.564	13.544
OBSTCLAE.rsa	0.734	1.570	0.913	0.753
OILPAN.rsa	12.180	9.875	14.072	12.178
onera_dual.kp	24.634	12.614	40.784	24.721
opt1.PSE	8.254	6.859	9.903	8.253
pds10.kp	11.436	4.481	15.167	14.160
pkustk01.PSA	1.723	2.285	2.013	1.712
pkustk02.PSA	1.210	1.658	1.293	1.208
pkustk03.PSA	9.886	9.298	10.923	9.821
pkustk04.PSA	24.806	18.212	34.196	40.537

Table 2.3.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
pkustk05.PSA	38.739	17.322	47.449	38.804
pkustk06.PSA	47.892	22.934	55.012	47.924
pkustk07.PSA	31.219	16.281	49.322	31.212
pkustk08.PSA	51.936	26.450	72.544	52.130
pkustk09.PSA	5.849	5.161	6.557	5.835
pkustk10.PSA	24.413	22.549	31.648	24.474
pkustk11.PSA	150.308	73.552	202.391	150.430
pkustk12.PSA	22.817	32.089	37.309	24.638
pkustk13.PSA	98.309	65.741	105.509	98.280
pkustk14.PSA	423.701	447.642	500.024	423.841
pwt.RSA	1.079	1.924	1.276	1.103
pwt.RSA	95.806	68.567	149.217	96.055
ramage02.PSE	77.036	28.069	90.282	77.006
s3dkq4m2.rsa	28.263	22.336	43.027	28.253
s3dkt3m2.rsa	17.928	20.952	31.656	17.962
SHIPSEC1.rsa	99.402	89.331	119.150	99.004
SHIPSEC5.rsa	151.747	160.419	173.898	151.911
SHIPSEC8.rsa	149.770	113.503	219.750	149.696
SHIP_001.rse	29.918	31.152	33.764	29.886
SHIP_003.rsa	331.452	261.088	383.385	331.846
shuttle_eddy.PSA	0.206	0.462	0.248	0.207
skirt.PSA	0.344	0.690	0.332	0.352
Srb1.PSE	9.827	11.796	12.755	9.858
struct3.PSA	4.216	5.811	4.738	4.250
tandem_dual.kp	21.881	12.414	31.943	21.973
tandem_vtx.kp	3.145	2.918	3.884	3.169
THREAD.rsa	91.781	80.093	128.384	92.114
TORSION1.rsa	0.739	1.566	0.911	0.754
trdheim.PSE	1.341	1.959	1.479	1.361
Troll.PSE	331.714	134.054	519.404	332.582
tsyl201.PSE	9.529	8.332	11.085	9.553
vanbody.rsa	5.127	7.820	5.916	5.145
wathen100.mat	0.966	2.334	1.382	0.978
wathen120.mat	1.230	2.932	1.785	1.240
X104.rsa	28.460	36.712	40.596	28.538

Table 2.3.3: Analyse time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	0.778	2.870	1.905	0.869
audikw_1.rsa	—	—	—	—
barth5.kp	0.074	0.402	0.047	0.082
bcsstk25.RSA	0.123	0.827	0.109	0.139
bcsstk29.PSA	0.133	0.826	0.157	0.140
bcsstk30.PSA	0.474	1.439	0.552	0.492
bcsstk31.PSA	0.379	1.847	0.469	0.403
bcsstk32.PSA	0.498	1.737	0.582	0.536

Table 2.3.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bcsstk36.RSA	0.228	0.534	0.280	0.236
bmw7st_1.rsa	1.729	4.711	2.376	1.781
bmwcra_1.rsa	2.825	12.967	6.703	2.955
bodyy4.RSA	0.079	0.446	0.061	0.089
bodyy5.RSA	0.084	0.467	0.063	0.097
bodyy6.RSA	0.085	0.481	0.066	0.094
cfid1.RSA	1.140	6.795	2.711	1.239
cfid2.RSA	1.711	11.692	5.628	1.823
copter1.kp	0.142	0.777	0.188	0.164
copter2.kp	0.754	3.523	1.244	0.826
crankseg_1.rsa	2.338	5.610	3.536	2.465
crankseg_2.rsa	2.925	6.886	4.878	3.117
crplat2.PSE	0.185	0.399	0.274	0.186
ct20stif.PSA	0.705	2.647	0.999	0.751
CVXBQP1.rsa	0.473	1.747	0.587	0.529
Fcondp2.PSE	2.403	6.537	4.150	2.462
finan512.RSA	0.420	2.948	0.485	0.435
finance256.kp	0.174	1.311	0.240	0.201
ford1.kp	0.086	0.425	0.044	0.093
ford2.kp	0.603	2.918	0.335	0.671
Fullb.PSE	2.650	7.925	6.304	2.764
gearbox.PSA	2.379	10.191	3.833	2.470
GRIDGENA.rsa	0.316	1.950	0.269	0.356
gupta1.PSA	105.480	5.716	0.609	4.952
gupta2.PSA	327.517	9.904	–	26.990
gupta3.PSA	34.416	6.677	1.498	13.661
Halfb.PSE	2.786	8.003	5.339	2.884
hood.rsa	2.531	5.230	3.126	2.626
inline_1.rsa	10.444	42.658	18.078	12.223
JNLBRNG1.rsa	0.165	0.958	0.122	0.183
ldoor.rsa	11.522	26.543	16.171	12.004
MINSURFO.rsa	0.177	0.970	0.122	0.193
msc10848.RSA	0.234	0.504	0.255	0.244
msc23052.RSA	0.268	0.544	0.292	0.271
M_T1.rsa	2.034	4.926	3.016	2.089
nasasrb.RSA	0.739	3.397	1.046	0.783
OBSTCLAE.rsa	0.160	0.950	0.124	0.178
OILPAN.rsa	0.753	1.551	1.035	0.780
onera_dual.kp	0.660	3.074	1.039	0.747
opt1.PSE	0.394	0.876	0.526	0.407
pds10.kp	0.356	0.753	0.111	0.467
pkustk01.PSA	0.206	0.430	0.224	0.210
pkustk02.PSA	0.147	0.263	0.163	0.152
pkustk03.PSA	0.667	1.458	0.882	0.688
pkustk04.PSA	1.130	1.945	1.196	1.040
pkustk05.PSA	0.507	1.180	1.011	0.525
pkustk06.PSA	0.562	1.383	1.173	0.583
pkustk07.PSA	0.493	1.444	0.922	0.510

Table 2.3.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
pkustk08.PSA	0.663	2.040	1.321	0.691
pkustk09.PSA	0.350	0.761	0.490	0.361
pkustk10.PSA	0.918	2.156	1.521	0.948
pkustk11.PSA	1.177	3.088	2.971	1.216
pkustk12.PSA	2.076	3.445	1.859	1.694
pkustk13.PSA	1.709	6.406	2.900	1.786
pkustk14.PSA	3.352	12.186	8.106	3.477
pwt.RSA	0.184	1.179	0.161	0.208
pwt.RSA	2.507	7.069	4.796	2.582
ramage02.PSE	0.582	1.702	1.291	0.590
s3dkq4m2.rsa	1.061	2.460	1.841	1.096
s3dkt3m2.rsa	0.849	2.123	1.531	0.877
SHIPSEC1.rsa	1.846	4.781	3.233	1.925
SHIPSEC5.rsa	2.237	6.225	4.088	2.320
SHIPSEC8.rsa	1.564	4.158	3.353	1.610
SHIP_001.rse	0.855	1.975	1.330	0.885
SHIP_003.rsa	1.803	5.633	5.109	1.874
shuttle.eddy.PSA	0.049	0.274	0.037	0.050
skirt.PSA	0.080	0.426	0.055	0.087
Srb1.PSE	0.661	1.484	0.955	0.675
struct3.PSA	0.449	2.558	0.469	0.472
tandem_dual.kp	0.762	3.362	0.988	0.859
tandem_vtx.kp	0.175	0.943	0.183	0.195
THREAD.rsa	0.970	3.400	2.009	1.006
TORSION1.rsa	0.160	0.946	0.122	0.178
trdheim.PSE	0.386	0.614	0.394	0.401
Troll.PSE	2.967	9.439	7.434	3.090
tsyl201.PSE	0.497	0.918	0.687	0.508
vanbody.rsa	0.587	2.293	0.655	0.611
wathen100.mat	0.146	1.422	0.161	0.157
wathen120.mat	0.181	1.750	0.202	0.194
X104.rsa	2.129	4.469	2.717	2.189

Table 2.3.4: Factorize time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	69.512	30.731	91.161	105.633
audikw_1.rsa	—	—	—	—
barth5.kp	0.168	0.162	0.186	0.169
bcsstk25.RSA	1.146	2.175	1.994	1.152
bcsstk29.PSA	1.346	1.982	2.782	1.349
bcsstk30.PSA	2.988	3.951	4.224	2.991
bcsstk31.PSA	6.670	4.061	8.832	6.688
bcsstk32.PSA	3.585	4.810	4.781	3.586
bcsstk36.RSA	2.057	2.329	2.320	2.063
bmw7st_1.rsa	38.242	32.632	45.792	38.312
bmwcra_1.rsa	268.082	141.179	348.771	268.067

Table 2.3.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bodyy4.RSA	0.306	0.241	0.341	0.305
bodyy5.RSA	0.324	0.268	0.352	0.325
bodyy6.RSA	0.353	0.292	0.386	0.353
cf1.RSA	99.283	37.168	156.474	99.338
cf2.RSA	216.344	70.408	408.658	216.101
copter1.kp	3.597	3.226	4.838	3.595
copter2.kp	30.434	19.629	50.380	30.497
crankseg1.rsa	99.986	76.224	133.743	132.932
crankseg2.rsa	192.267	101.192	233.170	253.216
crplat2.PSE	2.605	2.393	4.353	2.598
ct20stif.PSA	21.635	13.825	28.579	21.641
CVXBQP1.rsa	8.533	2.373	12.439	8.544
Fcondp2.PSE	98.323	122.926	140.145	97.885
finan512.RSA	7.770	1.220	24.661	7.743
finance256.kp	2.681	0.581	13.709	2.694
ford1.kp	0.153	0.157	0.158	0.154
ford2.kp	1.379	1.490	1.784	1.378
Fullb.PSE	404.408	335.959	478.068	404.585
gearbox.PSA	100.428	52.999	123.533	100.456
GRIDGENA.rsa	1.730	1.743	1.862	1.739
gupta1.PSA	8.853	16.467	12.728	12.598
gupta2.PSA	51.656	99.558	–	62.338
gupta3.PSA	80.356	26.908	91.690	84.824
Halfb.PSE	181.174	190.503	275.578	181.165
hood.rsa	25.556	26.182	32.661	25.603
inline1.rsa	524.088	347.156	731.964	871.734
JNLBRNG1.rsa	0.554	0.575	0.676	0.550
ldoor.rsa	267.793	190.050	315.609	267.636
MINSURFO.rsa	0.544	0.602	0.666	0.547
msc10848.RSA	1.828	1.957	1.948	1.823
msc23052.RSA	1.937	2.252	2.258	1.946
M_T1.rsa	49.208	52.096	60.805	49.362
nasasrb.RSA	12.427	10.589	17.159	12.441
OBSTCLAE.rsa	0.532	0.578	0.739	0.533
OILPAN.rsa	11.133	8.051	12.728	11.104
onera_dual.kp	23.660	9.329	39.353	23.656
opt1.PSE	7.731	5.863	9.234	7.716
pds10.kp	11.030	3.688	14.999	13.641
pkustk01.PSA	1.451	1.787	1.723	1.436
pkustk02.PSA	1.028	1.355	1.091	1.021
pkustk03.PSA	8.966	7.588	9.773	8.874
pkustk04.PSA	23.397	16.021	32.691	39.173
pkustk05.PSA	37.878	15.899	46.039	37.916
pkustk06.PSA	46.895	21.248	53.370	46.909
pkustk07.PSA	30.470	14.647	48.093	30.453
pkustk08.PSA	50.900	24.143	70.784	51.051
pkustk09.PSA	5.350	4.262	5.910	5.324
pkustk10.PSA	22.989	19.938	29.595	23.041

Table 2.3.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
pkustk11.PSA	148.048	69.742	198.186	148.130
pkustk12.PSA	20.373	28.210	35.007	22.556
pkustk13.PSA	95.665	58.571	101.622	95.560
pkustk14.PSA	417.383	432.729	488.688	417.397
pwt.RSA	0.834	0.690	1.048	0.835
pwt.RSA	91.822	60.153	142.605	91.988
ramage02.PSE	76.025	26.098	88.515	75.988
s3dkq4m2.rsa	26.680	19.382	40.563	26.639
s3dkt3m2.rsa	16.632	18.368	29.582	16.639
SHIPSEC1.rsa	96.551	83.427	114.859	96.076
SHIPSEC5.rsa	148.190	152.792	168.397	148.259
SHIPSEC8.rsa	147.161	108.389	215.163	147.046
SHIP_001.rse	28.690	28.803	32.023	28.627
SHIP_003.rsa	327.727	253.945	376.202	328.054
shuttle.eddy.PSA	0.148	0.176	0.201	0.147
skirt.PSA	0.250	0.249	0.264	0.252
Srb1.PSE	8.897	10.026	11.507	8.913
struct3.PSA	3.608	3.106	4.103	3.622
tandem_dual.kp	20.786	8.824	30.563	20.783
tandem_vtx.kp	2.895	1.916	3.620	2.900
THREAD.rsa	90.203	76.112	125.684	90.492
TORSION1.rsa	0.536	0.578	0.739	0.534
trdheim.PSE	0.905	1.282	1.029	0.908
Troll.PSE	326.494	122.973	509.102	327.241
tsyl201.PSE	8.869	7.253	10.225	8.883
vanbody.rsa	4.375	5.346	5.083	4.370
wathen100.mat	0.769	0.852	1.161	0.770
wathen120.mat	0.985	1.107	1.507	0.982
X104.rsa	25.713	31.562	37.181	25.733

Table 2.3.5: Solution time given factors (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	0.647	0.460	0.732	0.782
audikw_1.rsa	—	—	—	—
barth5.kp	0.014	0.014	0.015	0.013
bcsstk25.RSA	0.042	0.050	0.048	0.044
bcsstk29.PSA	0.046	0.050	0.055	0.047
bcsstk30.PSA	0.108	0.127	0.126	0.110
bcsstk31.PSA	0.145	0.126	0.165	0.145
bcsstk32.PSA	0.152	0.171	0.171	0.152
bcsstk36.RSA	0.080	0.086	0.084	0.081
bmw7st_1.rsa	0.737	0.739	0.781	0.735
bmwcra_1.rsa	2.273	1.698	2.599	2.267
bodyy4.RSA	0.020	0.020	0.021	0.020
bodyy5.RSA	0.022	0.021	0.023	0.022
bodyy6.RSA	0.024	0.024	0.025	0.024

Table 2.3.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
cf1.RSA	0.899	0.555	1.133	0.898
cf2.RSA	1.684	0.969	2.232	1.681
copter1.kp	0.063	0.055	0.072	0.063
copter2.kp	0.372	0.280	0.463	0.372
crankseg_1.rsa	0.902	0.815	1.015	0.999
crankseg_2.rsa	1.337	1.037	1.474	1.525
crplat2.PSE	0.078	0.079	0.102	0.078
ct20stif.PSA	0.297	0.272	0.345	0.299
CVXBQP1.rsa	0.129	0.088	0.162	0.130
Fcondp2.PSE	1.227	1.431	1.472	1.231
finan512.RSA	0.141	0.086	0.205	0.141
finance256.kp	0.069	0.039	0.104	0.069
ford1.kp	0.012	0.013	0.014	0.012
ford2.kp	0.116	0.121	0.125	0.116
Fullb.PSE	2.148	1.902	2.367	2.149
gearbox.PSA	1.200	0.961	1.315	1.197
GRIDGENA.rsa	0.100	0.099	0.102	0.102
gupta1.PSA	0.089	0.097	0.091	0.091
gupta2.PSA	0.243	0.241	–	0.249
gupta3.PSA	0.154	0.269	0.157	0.170
Halfb.PSE	1.621	1.749	1.904	1.616
hood.rsa	0.818	0.843	0.892	0.821
inline_1.rsa	5.498	4.495	6.363	7.222
JNLBRNG1.rsa	0.047	0.044	0.049	0.045
ldoor.rsa	4.421	4.282	4.749	4.433
MINSURFO.rsa	0.044	0.047	0.048	0.044
msc10848.RSA	0.052	0.055	0.054	0.053
msc23052.RSA	0.080	0.087	0.084	0.079
M_T1.rsa	0.788	0.851	0.872	0.788
nasasrb.RSA	0.321	0.289	0.359	0.320
OBSTCLAE.rsa	0.042	0.043	0.050	0.043
OILPAN.rsa	0.294	0.273	0.309	0.294
onera_dual.kp	0.314	0.211	0.391	0.318
opt1.PSE	0.129	0.120	0.143	0.130
pds10.kp	0.050	0.039	0.057	0.053
pkustk01.PSA	0.061	0.065	0.064	0.061
pkustk02.PSA	0.035	0.039	0.037	0.035
pkustk03.PSA	0.254	0.250	0.267	0.253
pkustk04.PSA	0.278	0.245	0.308	0.319
pkustk05.PSA	0.355	0.243	0.399	0.356
pkustk06.PSA	0.429	0.303	0.467	0.429
pkustk07.PSA	0.249	0.182	0.306	0.249
pkustk08.PSA	0.372	0.266	0.436	0.372
pkustk09.PSA	0.148	0.138	0.154	0.149
pkustk10.PSA	0.482	0.451	0.532	0.482
pkustk11.PSA	1.079	0.721	1.230	1.081
pkustk12.PSA	0.368	0.417	0.436	0.387
pkustk13.PSA	0.927	0.764	0.987	0.926

Table 2.3.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
pkustk14.PSA	2.966	2.727	3.229	2.966
pwt.RSA	0.061	0.055	0.066	0.060
pwtk.RSA	1.477	1.345	1.815	1.485
ramage02.PSE	0.429	0.268	0.475	0.428
s3dkq4m2.rsa	0.522	0.493	0.624	0.518
s3dkt3m2.rsa	0.447	0.461	0.543	0.446
SHIPSEC1.rsa	1.005	1.122	1.058	1.003
SHIPSEC5.rsa	1.321	1.403	1.412	1.332
SHIPSEC8.rsa	1.045	0.956	1.235	1.039
SHIP_001.rse	0.374	0.374	0.411	0.374
SHIP_003.rsa	1.922	1.509	2.074	1.918
shuttle_eddy.PSA	0.009	0.012	0.010	0.010
skirt.PSA	0.014	0.016	0.014	0.014
Srb1.PSE	0.269	0.285	0.294	0.269
struct3.PSA	0.159	0.147	0.166	0.155
tandem_dual.kp	0.333	0.227	0.391	0.331
tandem_vtx.kp	0.075	0.060	0.082	0.074
THREAD.rsa	0.608	0.581	0.691	0.616
TORSION1.rsa	0.043	0.043	0.050	0.043
trdheim.PSE	0.051	0.062	0.056	0.052
Troll.PSE	2.253	1.642	2.868	2.251
tsyl201.PSE	0.163	0.161	0.174	0.163
vanbody.rsa	0.165	0.182	0.178	0.165
wathen100.mat	0.051	0.060	0.060	0.051
wathen120.mat	0.064	0.075	0.076	0.064
X104.rsa	0.619	0.681	0.698	0.616

Table 2.3.6: Minimum memory required (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	3.2E+02	2.2E+02	3.8E+02	4.1E+02
audikw_1.rsa	—	—	—	—
barth5.kp	5.8E+00	5.8E+00	6.1E+00	5.8E+00
bcsstk25.RSA	1.8E+01	2.0E+01	2.0E+01	1.8E+01
bcsstk29.PSA	2.7E+01	2.5E+01	2.8E+01	2.7E+01
bcsstk30.PSA	6.5E+01	6.9E+01	7.2E+01	6.5E+01
bcsstk31.PSA	7.1E+01	5.7E+01	8.2E+01	7.1E+01
bcsstk32.PSA	7.5E+01	7.9E+01	8.4E+01	7.5E+01
bcsstk36.RSA	4.5E+01	4.4E+01	4.6E+01	4.5E+01
bmw7st_1.rsa	3.6E+02	3.3E+02	3.7E+02	3.6E+02
bmwcra_1.rsa	1.0E+03	7.4E+02	1.1E+03	1.0E+03
bodyy4.RSA	8.6E+00	7.5E+00	8.9E+00	8.6E+00
bodyy5.RSA	9.0E+00	8.1E+00	9.2E+00	9.0E+00
bodyy6.RSA	9.6E+00	8.5E+00	9.9E+00	9.6E+00
cfdl.RSA	4.0E+02	2.4E+02	5.1E+02	4.0E+02
cfld2.RSA	7.2E+02	4.0E+02	1.1E+03	7.2E+02
copter1.kp	3.5E+01	2.4E+01	3.7E+01	3.5E+01

Table 2.3.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
copter2.kp	1.6E+02	1.1E+02	2.1E+02	1.6E+02
crankseg.1.rsa	5.3E+02	4.6E+02	5.8E+02	5.8E+02
crankseg.2.rsa	7.8E+02	5.8E+02	8.3E+02	8.6E+02
crplat2.PSE	4.5E+01	4.0E+01	5.2E+01	4.5E+01
ct20stif.PSA	1.9E+02	1.3E+02	2.0E+02	1.9E+02
CVXBQP1.rsa	7.5E+01	3.1E+01	8.4E+01	7.5E+01
Fcondp2.PSE	6.5E+02	6.8E+02	7.3E+02	6.5E+02
finan512.RSA	8.1E+01	2.9E+01	1.0E+02	8.1E+01
finance256.kp	3.0E+01	1.4E+01	7.4E+01	3.0E+01
ford1.kp	5.6E+00	5.7E+00	5.6E+00	5.6E+00
ford2.kp	3.6E+01	3.8E+01	4.0E+01	3.6E+01
Fullb.PSE	1.2E+03	8.7E+02	1.3E+03	1.2E+03
gearbox.PSA	6.0E+02	4.7E+02	6.5E+02	6.0E+02
GRIDGENA.rsa	3.7E+01	3.5E+01	3.8E+01	3.7E+01
gupta1.PSA	1.6E+02	4.4E+02	2.9E+02	4.0E+02
gupta2.PSA	4.8E+02	1.4E+03	–	6.8E+02
gupta3.PSA	4.4E+02	4.6E+02	3.0E+02	4.4E+02
Halfb.PSE	8.2E+02	8.2E+02	9.4E+02	8.2E+02
hood.rsa	3.9E+02	4.0E+02	4.2E+02	3.9E+02
inline.1.rsa	2.5E+03	2.0E+03	2.7E+03	3.1E+03
JNLBRNG1.rsa	1.6E+01	1.6E+01	1.7E+01	1.6E+01
ldoor.rsa	2.1E+03	1.9E+03	2.1E+03	2.1E+03
MINSURFO.rsa	1.6E+01	1.6E+01	1.7E+01	1.6E+01
msc10848.RSA	3.8E+01	3.7E+01	3.9E+01	3.8E+01
msc23052.RSA	4.4E+01	4.4E+01	4.6E+01	4.4E+01
M_T1.rsa	4.3E+02	4.4E+02	4.6E+02	4.3E+02
nasasrb.RSA	1.4E+02	1.3E+02	1.6E+02	1.4E+02
OBSTCLAE.rsa	1.5E+01	1.5E+01	1.8E+01	1.5E+01
OILPAN.rsa	1.5E+02	1.3E+02	1.5E+02	1.5E+02
onera_dual.kp	1.7E+02	6.9E+01	1.8E+02	1.7E+02
opt1.PSE	9.0E+01	7.2E+01	9.3E+01	9.0E+01
pds10.kp	5.4E+01	1.8E+01	5.2E+01	5.0E+01
pkustk01.PSA	3.4E+01	3.4E+01	3.4E+01	3.4E+01
pkustk02.PSA	2.6E+01	2.6E+01	2.6E+01	2.6E+01
pkustk03.PSA	1.3E+02	1.2E+02	1.3E+02	1.3E+02
pkustk04.PSA	1.8E+02	1.5E+02	2.1E+02	2.3E+02
pkustk05.PSA	2.1E+02	1.2E+02	2.2E+02	2.1E+02
pkustk06.PSA	2.5E+02	1.4E+02	2.5E+02	2.5E+02
pkustk07.PSA	1.9E+02	1.2E+02	2.4E+02	1.9E+02
pkustk08.PSA	2.7E+02	1.7E+02	2.9E+02	2.7E+02
pkustk09.PSA	7.5E+01	6.6E+01	7.8E+01	7.5E+01
pkustk10.PSA	2.3E+02	2.1E+02	2.5E+02	2.3E+02
pkustk11.PSA	5.6E+02	3.4E+02	6.3E+02	5.6E+02
pkustk12.PSA	2.5E+02	2.6E+02	2.9E+02	2.5E+02
pkustk13.PSA	5.1E+02	3.8E+02	4.9E+02	5.1E+02
pkustk14.PSA	1.3E+03	1.2E+03	1.5E+03	1.3E+03
pwt.RSA	2.0E+01	1.9E+01	2.3E+01	2.0E+01
pwtk.RSA	6.8E+02	5.8E+02	7.9E+02	6.8E+02

Table 2.3.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
ramage02.PSE	3.6E+02	1.6E+02	3.6E+02	3.6E+02
s3dkq4m2.rsa	2.6E+02	2.3E+02	3.1E+02	2.6E+02
s3dkt3m2.rsa	2.0E+02	2.0E+02	2.5E+02	2.0E+02
SHIPSEC1.rsa	5.3E+02	4.8E+02	5.7E+02	5.3E+02
SHIPSEC5.rsa	6.8E+02	6.7E+02	6.9E+02	6.8E+02
SHIPSEC8.rsa	5.9E+02	4.6E+02	6.8E+02	5.9E+02
SHIP_001.rse	2.3E+02	2.0E+02	2.2E+02	2.3E+02
SHIP_003.rsa	9.3E+02	6.8E+02	9.9E+02	9.3E+02
shuttle_eddy.PS	4.9E+00	5.4E+00	5.8E+00	4.9E+00
skirt.PSA	7.7E+00	7.4E+00	7.5E+00	7.7E+00
Srb1.PSE	1.3E+02	1.3E+02	1.4E+02	1.3E+02
struct3.PSA	6.2E+01	5.9E+01	6.7E+01	6.2E+01
tandem_dual.kp	1.5E+02	7.3E+01	1.5E+02	1.5E+02
tandem_vtx.kp	3.4E+01	2.3E+01	3.6E+01	3.4E+01
THREAD.rsa	3.8E+02	3.4E+02	4.7E+02	3.8E+02
TORSION1.rsa	1.5E+01	1.5E+01	1.8E+01	1.5E+01
trdheim.PSE	4.3E+01	4.7E+01	4.4E+01	4.3E+01
Troll.PSE	1.2E+03	7.5E+02	1.4E+03	1.2E+03
tsyl201.PSE	1.1E+02	9.5E+01	1.1E+02	1.1E+02
vanbody.rsa	8.6E+01	8.9E+01	8.9E+01	8.6E+01
wathen100.mat	2.1E+01	2.2E+01	2.5E+01	2.1E+01
wathen120.mat	2.6E+01	2.8E+01	3.1E+01	2.6E+01
X104.rsa	3.6E+02	3.8E+02	4.1E+02	3.6E+02

Table 2.3.7: Actual memory used (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	3.4E+02	2.3E+02	3.9E+02	4.3E+02
audikw_1.rsa	—	—	—	—
barth5.kp	6.8E+00	7.0E+00	7.3E+00	6.8E+00
bcsstk25.RSA	2.0E+01	2.3E+01	2.2E+01	2.0E+01
bcsstk29.PSA	3.0E+01	3.1E+01	3.1E+01	3.0E+01
bcsstk30.PSA	7.3E+01	8.0E+01	8.0E+01	7.3E+01
bcsstk31.PSA	7.6E+01	6.6E+01	8.8E+01	7.7E+01
bcsstk32.PSA	8.4E+01	9.0E+01	9.2E+01	8.4E+01
bcsstk36.RSA	5.0E+01	5.0E+01	5.1E+01	5.0E+01
bmw7st_1.rsa	3.9E+02	3.7E+02	4.1E+02	3.9E+02
bmwcra_1.rsa	1.1E+03	8.0E+02	1.2E+03	1.1E+03
bodyy4.RSA	9.5E+00	9.2E+00	1.0E+01	9.6E+00
bodyy5.RSA	1.0E+01	9.9E+00	1.1E+01	1.0E+01
bodyy6.RSA	1.1E+01	1.0E+01	1.1E+01	1.1E+01
cf1.RSA	4.1E+02	2.6E+02	5.2E+02	4.1E+02
cf2.RSA	7.4E+02	4.4E+02	1.1E+03	7.4E+02
copter1.kp	3.7E+01	2.7E+01	3.9E+01	3.7E+01
copter2.kp	1.7E+02	1.2E+02	2.1E+02	1.7E+02
crankseg_1.rsa	5.7E+02	5.0E+02	6.2E+02	6.3E+02
crankseg_2.rsa	8.4E+02	6.4E+02	8.8E+02	9.2E+02

Table 2.3.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crplat2.PSE	4.9E+01	4.5E+01	5.7E+01	5.0E+01
ct20stif.PSA	2.0E+02	1.5E+02	2.1E+02	2.0E+02
CVXBQP1.rsa	7.7E+01	4.1E+01	8.7E+01	7.7E+01
Fcondp2.PSE	7.0E+02	7.4E+02	7.9E+02	7.0E+02
finan512.RSA	8.4E+01	3.5E+01	1.0E+02	8.4E+01
finance256.kp	3.3E+01	1.7E+01	7.6E+01	3.3E+01
ford1.kp	6.5E+00	6.7E+00	6.8E+00	6.5E+00
ford2.kp	4.0E+01	4.2E+01	4.5E+01	4.0E+01
Fullb.PSE	1.3E+03	9.3E+02	1.3E+03	1.3E+03
gearbox.PSA	6.4E+02	5.1E+02	6.9E+02	6.4E+02
GRIDGENA.rsa	4.1E+01	4.6E+01	4.2E+01	4.1E+01
gupta1.PSA	1.7E+02	4.6E+02	3.0E+02	4.2E+02
gupta2.PSA	5.0E+02	1.4E+03	–	7.0E+02
gupta3.PSA	4.9E+02	5.1E+02	3.5E+02	4.7E+02
Halfb.PSE	8.7E+02	8.8E+02	1.0E+03	8.7E+02
hood.rsa	4.4E+02	4.5E+02	4.7E+02	4.4E+02
inline_1.rsa	2.6E+03	2.2E+03	2.9E+03	3.3E+03
JNLBRNG1.rsa	1.8E+01	2.2E+01	2.0E+01	1.8E+01
ldoor.rsa	2.3E+03	2.2E+03	2.4E+03	2.3E+03
MINSURFO.rsa	1.8E+01	2.0E+01	2.0E+01	1.8E+01
msc10848.RSA	4.3E+01	4.3E+01	4.4E+01	4.3E+01
msc23052.RSA	4.9E+01	5.1E+01	5.1E+01	4.9E+01
M_T1.rsa	4.8E+02	5.1E+02	5.0E+02	4.8E+02
nasasrb.RSA	1.5E+02	1.5E+02	1.8E+02	1.5E+02
OBSTCLAE.rsa	1.7E+01	2.1E+01	2.0E+01	1.7E+01
OILPAN.rsa	1.6E+02	1.5E+02	1.7E+02	1.6E+02
onera_dual.kp	1.7E+02	7.7E+01	1.8E+02	1.7E+02
opt1.PSE	9.8E+01	8.2E+01	1.0E+02	9.8E+01
pds10.kp	5.5E+01	1.9E+01	5.3E+01	5.1E+01
pkustk01.PSA	3.8E+01	3.9E+01	3.9E+01	3.8E+01
pkustk02.PSA	2.9E+01	3.0E+01	2.9E+01	2.9E+01
pkustk03.PSA	1.5E+02	1.4E+02	1.5E+02	1.5E+02
pkustk04.PSA	2.0E+02	1.7E+02	2.3E+02	2.4E+02
pkustk05.PSA	2.1E+02	1.3E+02	2.3E+02	2.1E+02
pkustk06.PSA	2.6E+02	1.6E+02	2.6E+02	2.6E+02
pkustk07.PSA	2.0E+02	1.3E+02	2.5E+02	2.0E+02
pkustk08.PSA	2.8E+02	1.9E+02	3.0E+02	2.8E+02
pkustk09.PSA	8.2E+01	7.5E+01	8.4E+01	8.2E+01
pkustk10.PSA	2.5E+02	2.4E+02	2.7E+02	2.5E+02
pkustk11.PSA	5.8E+02	3.6E+02	6.6E+02	5.8E+02
pkustk12.PSA	2.8E+02	2.9E+02	3.2E+02	2.8E+02
pkustk13.PSA	5.4E+02	4.3E+02	5.2E+02	5.4E+02
pkustk14.PSA	1.4E+03	1.2E+03	1.5E+03	1.4E+03
pwt.RSA	2.3E+01	2.2E+01	2.6E+01	2.3E+01
pwtk.RSA	7.3E+02	6.5E+02	8.4E+02	7.3E+02
ramage02.PSE	3.7E+02	1.7E+02	3.7E+02	3.7E+02
s3dkq4m2.rsa	2.8E+02	2.6E+02	3.3E+02	2.8E+02
s3dkt3m2.rsa	2.2E+02	2.3E+02	2.7E+02	2.2E+02

Table 2.3.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
SHIPSEC1.rsa	5.6E+02	5.2E+02	6.1E+02	5.6E+02
SHIPSEC5.rsa	7.3E+02	7.3E+02	7.4E+02	7.3E+02
SHIPSEC8.rsa	6.2E+02	5.0E+02	7.1E+02	6.2E+02
SHIP_001.rse	2.3E+02	2.2E+02	2.3E+02	2.3E+02
SHIP_003.rsa	9.7E+02	7.2E+02	1.0E+03	9.7E+02
shuttle_eddy.PS	5.8E+00	6.6E+00	6.8E+00	5.8E+00
skirt.PSA	9.1E+00	9.6E+00	9.1E+00	9.1E+00
Srb1.PSE	1.4E+02	1.5E+02	1.6E+02	1.4E+02
struct3.PSA	6.8E+01	6.9E+01	7.4E+01	6.9E+01
tandem_dual.kp	1.5E+02	8.2E+01	1.6E+02	1.5E+02
tandem_vtx.kp	3.6E+01	2.8E+01	3.8E+01	3.6E+01
THREAD.rsa	4.0E+02	3.6E+02	4.9E+02	4.0E+02
TORSION1.rsa	1.7E+01	2.1E+01	2.0E+01	1.7E+01
trdheim.PSE	5.1E+01	5.6E+01	5.3E+01	5.1E+01
Troll.PSE	1.3E+03	8.2E+02	1.4E+03	1.3E+03
tsyl201.PSE	1.2E+02	1.1E+02	1.2E+02	1.2E+02
vanbody.rsa	9.7E+01	1.0E+02	1.0E+02	9.7E+01
wathen100.mat	2.4E+01	2.6E+01	2.9E+01	2.4E+01
wathen120.mat	3.0E+01	3.2E+01	3.5E+01	3.0E+01
X104.rsa	4.1E+02	4.3E+02	4.5E+02	4.1E+02

Table 2.3.8: Number of integers used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	593848	668577	606470	622771
audikw_1.rsa	—	—	—	—
barth5.kp	129162	140437	131041	129162
bcsstk25.RSA	198909	268559	238076	198909
bcsstk29.PSA	128099	198612	196786	128099
bcsstk30.PSA	236964	270599	247588	236964
bcsstk31.PSA	350522	401964	362416	350522
bcsstk32.PSA	386919	448391	401825	386919
bcsstk36.RSA	175297	195537	177830	175297
bmw7st_1.rsa	1246423	1390170	1275799	1246423
bmwcra_1.rsa	2197593	2319362	2254487	2197593
bodyy4.RSA	151198	165324	153568	151198
bodyy5.RSA	161945	174141	163910	161945
bodyy6.RSA	169408	182302	171450	169408
cf1.RSA	1412135	1224482	1474439	1412135
cf2.RSA	1985564	2086459	2101570	1985564
copter1.kp	234500	284403	248686	234500
copter2.kp	841598	984319	884260	841598
crankseg_1.rsa	642792	679793	656473	653757
crankseg_2.rsa	792897	806780	811104	810389
crplat2.PSE	140341	155443	149511	140341
ct20stif.PSA	531992	598814	555569	531992
CVXBQP1.rsa	517265	518335	534043	517265

Table 2.3.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
Fcondp2.PSE	1714767	2005466	1842977	1714767
finan512.RSA	664470	703603	926525	664470
finance256.kp	340305	350977	464205	340305
ford1.kp	146364	159380	146685	146364
ford2.kp	813347	894572	818096	813347
Fullb.PSE	1913535	2477275	2012234	1913535
gearbox.PSA	1765801	1878972	1826356	1765801
GRIDGENA.rsa	526713	590095	524538	526713
gupta1.PSA	1809232	1900783	1894966	1844960
gupta2.PSA	4768120	5079200	–	4787104
gupta3.PSA	3778186	280374	3948045	3631788
Halfb.PSE	1947919	2358354	2033061	1947919
hood.rsa	1512089	1665822	1517470	1512089
inline_1.rsa	6988037	7181062	7065902	7166910
JNLBRNG1.rsa	323270	371134	327153	323270
ldoor.rsa	6804193	7455060	6800041	6804193
MINSURFO.rsa	329640	382829	333029	329640
msc10848.RSA	92944	103017	95324	92944
msc23052.RSA	174049	193172	177573	174049
M_T1.rsa	774529	886282	797409	774529
nasasrb.RSA	603335	669926	629485	603335
OBSTCLAE.rsa	317667	370929	333326	317667
OILPAN.rsa	510375	559298	512598	510375
onera_dual.kp	915200	1049588	1014133	915200
opt1.PSE	148901	158475	154517	148901
pds10.kp	394219	334046	440969	374859
pkustk01.PSA	156184	180460	166562	156184
pkustk02.PSA	77333	87217	77327	77333
pkustk03.PSA	470191	512197	477135	470191
pkustk04.PSA	438985	511124	455489	475054
pkustk05.PSA	464093	455758	483204	464093
pkustk06.PSA	553389	525153	546653	553389
pkustk07.PSA	226852	245421	239737	226852
pkustk08.PSA	306356	329339	319087	306356
pkustk09.PSA	250475	272579	253729	250475
pkustk10.PSA	686401	732429	698883	686401
pkustk11.PSA	1083311	1082063	1116546	1083311
pkustk12.PSA	716053	829677	739537	743637
pkustk13.PSA	1221176	1348137	1233192	1221176
pkustk14.PSA	2307409	2896196	2337393	2307409
pwt.RSA	333560	369439	342872	333560
pwtk.RSA	1860514	2114407	1941002	1860514
ramage02.PSE	227473	235126	232571	227473
s3dkq4m2.rsa	708519	803729	754335	708519
s3dkt3m2.rsa	614529	753197	727257	614529
SHIPSEC1.rsa	1254413	1418631	1286827	1254413
SHIPSEC5.rsa	1595055	1948440	1637672	1595055
SHIPSEC8.rsa	1101607	1307929	1210020	1101607

Table 2.3.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
SHIP_001.rse	392291	449279	390251	392291
SHIP_003.rsa	1568906	2009039	1604388	1568906
shuttle_eddy.PSA	90388	102198	93578	90388
skirt.PSA	113718	126687	118653	113718
Srb1.PSE	437039	490183	446211	437039
struct3.PSA	591639	642422	609252	591639
tandem_dual.kp	1009081	1175801	1098798	1009081
tandem_vtx.kp	258293	294225	265951	258293
THREAD.rsa	372308	437506	384474	372308
TORSION1.rsa	317667	370929	333326	317667
trdheim.PSE	118105	133879	123357	118105
Troll.PSE	2160057	2392542	2237274	2160057
tsyl201.PSE	158313	173318	161291	158313
vanbody.rsa	403711	454480	414923	403711
wathen100.mat	242536	274979	252022	242536
wathen120.mat	291929	334969	303236	291929
X104.rsa	812715	887271	842947	812715

Table 2.3.9: Number of reals used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	27319452	18517940	31226319	33909535
audikw_1.rsa	—	—	—	—
barth5.kp	370107	366211	402895	370107
bcsstk25.RSA	1438911	1674397	1637650	1438911
bcsstk29.PSA	1685820	1701133	1863770	1685820
bcsstk30.PSA	3792025	4487009	4600464	3792025
bcsstk31.PSA	5229432	4331357	6050471	5229432
bcsstk32.PSA	5056239	5760065	5900123	5056239
bcsstk36.RSA	2740147	2968281	2916254	2740147
bmw7st_1.rsa	26495558	25889346	28932892	26495558
bmwera_1.rsa	95047287	68952457	109249922	95047287
bodyy4.RSA	583749	511747	633115	583749
bodyy5.RSA	616324	562973	668537	616324
bodyy6.RSA	676617	605509	722843	676617
cf1.RSA	37162044	21490054	46746647	37162044
cf2.RSA	68693513	37345408	95144418	68693513
copter1.kp	2348128	1831690	2670583	2348128
copter2.kp	14132982	9693996	18010432	14132982
crankseg_1.rsa	38857027	33503965	44392447	43863184
crankseg_2.rsa	58641898	42631756	65034133	67089112
crplat2.PSE	2868538	2851618	3666546	2868538
ct20stif.PSA	11449220	9955327	13045074	11449220
CVXBQP1.rsa	4141288	2035410	5375688	4141288
Fcondp2.PSE	47461422	54290943	58394154	47461422
finan512.RSA	4318376	1825268	6322943	4318376
finance256.kp	2072826	892975	3450444	2072826
ford1.kp	308679	326005	320027	308679

Table 2.3.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
ford2.kp	2349485	2468082	2717505	2349485
Fullb.PSE	87772341	73573201	93776914	87772341
gearbox.PSA	47925678	36606535	53487367	47925678
GRIDGENA.rsa	2814892	2700802	2987882	2814892
gupta1.PSA	2056311	2059009	2021303	2053762
gupta2.PSA	5889974	5795380	–	5911483
gupta3.PSA	5717930	10054068	5720806	6224188
Halfb.PSE	63495008	66887189	74330664	63495008
hood.rsa	26733049	27062133	29487927	26733049
inline_1.rsa	219283576	174327533	254405969	287930406
JNLBRNG1.rsa	1002598	988197	1149202	1002598
ldoor.rsa	154824782	142815623	167120036	154824782
MINSURFO.rsa	986665	1034971	1128491	986665
msc10848.RSA	2019102	2119785	2135706	2019102
msc23052.RSA	2672545	2932766	2884132	2672545
M_T1.rsa	31540518	33964470	35483112	31540518
nasasrb.RSA	11801342	10492837	13743279	11801342
OBSTCLAE.rsa	949727	940703	1180869	949727
OILPAN.rsa	10043754	8905925	10748521	10043754
onera_dual.kp	11135566	6089656	13485175	11135566
opt1.PSE	5244170	4616500	5821546	5244170
pds10.kp	1603897	1167048	1703809	1768120
pkustk01.PSA	1950306	2074497	2073903	1950306
pkustk02.PSA	1301760	1466568	1364760	1301760
pkustk03.PSA	8777112	8415996	9339360	8777112
pkustk04.PSA	10530165	8835282	12099333	12617778
pkustk05.PSA	14093682	8998086	15513270	14093682
pkustk06.PSA	16941186	11309598	18402246	16941186
pkustk07.PSA	10931415	7609515	13755228	10931415
pkustk08.PSA	16454352	11187984	19273737	16454352
pkustk09.PSA	5315820	4772796	5572536	5315820
pkustk10.PSA	18073854	16609158	20360898	18073854
pkustk11.PSA	43181298	27484554	49164030	43181298
pkustk12.PSA	13236911	15129929	16450686	13777573
pkustk13.PSA	37198835	29914078	39402896	37198835
pkustk14.PSA	123880513	107756521	136859701	123880513
pwt.RSA	1562848	1376906	1810688	1562848
pwtk.RSA	56936761	48816447	70305608	56936761
ramage02.PSE	19320199	11315790	21067855	19320199
s3dkq4m2.rsa	19470377	17966702	24509801	19470377
s3dkt3m2.rsa	16051262	16568204	20404778	16051262
SHIPSEC1.rsa	39355023	39444519	41874339	39355023
SHIPSEC5.rsa	52162067	52907942	54741215	52162067
SHIPSEC8.rsa	42349323	36556083	49100211	42349323
SHIP_001.rse	15377488	14914225	16555273	15377488
SHIP_003.rsa	78790437	59059873	84767565	78790437
shuttle_eddy.PSA	325649	371245	404398	325649
skirt.PSA	480826	479404	497449	480826

Table 2.3.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
Srb1.PSE	9928218	10456698	11020746	9928218
struct3.PSA	4989510	4566105	5362659	4989510
tandem_dual.kp	11492187	6496095	13454259	11492187
tandem_vtx.kp	2647866	1999916	2957410	2647866
THREAD.rsa	26407809	24419286	30751263	26407809
TORSION1.rsa	949727	940703	1180869	949727
trdheim.PSE	1709871	2138415	1878747	1709871
Troll.PSE	91754685	63558618	117334143	91754685
tsyl201.PSE	6436527	6286335	6908541	6436527
vanbody.rsa	5490550	6098229	6085197	5490550
wathen100.mat	1427594	1606984	1818911	1427594
wathen120.mat	1774509	2024792	2282697	1774509
X104.rsa	23430108	25909968	26665176	23430108

Table 2.3.10: Total number of integers used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	1674809	1674831	1674809	1674809
audikw_1.rsa	—	—	—	—
barth5.kp	130212	140902	131684	130212
bcsstk25.RSA	206117	269415	239028	206117
bcsstk29.PSA	330743	330749	330743	330743
bcsstk30.PSA	1065137	1065137	1065138	1065137
bcsstk31.PSA	644095	644291	644095	644095
bcsstk32.PSA	1074284	1074269	1074301	1074284
bcsstk36.RSA	606153	606153	606153	606153
bmw7st_1.rsa	3881860	3881860	3881860	3881860
bmwcra_1.rsa	5545161	5545161	5545161	5545161
bodyy4.RSA	152718	166075	154564	152718
bodyy5.RSA	163316	174913	164975	163316
bodyy6.RSA	170799	183076	172760	170799
cf1.RSA	1452167	1237217	1507465	1452167
cf2.RSA	2048848	2104525	2143294	2048848
copter1.kp	242383	287225	253960	242383
copter2.kp	866219	987793	896667	866219
crankseg_1.rsa	5386316	5386316	5386316	5386316
crankseg_2.rsa	7170191	7170191	7170191	7170191
crplat2.PSE	507493	507493	507493	507493
ct20stif.PSA	1427730	1427758	1427730	1427730
CVXBQP1.rsa	519658	521468	541085	519658
Fcondp2.PSE	5949896	5949896	5949896	5949896
finan512.RSA	670430	703891	927210	670430
finance256.kp	344796	351426	466150	344796
ford1.kp	147055	159758	147111	147055
ford2.kp	814796	895422	819569	814796
Fullb.PSE	6152824	6152824	6152824	6152824
gearbox.PSA	4770826	4770862	4770861	4770826

Table 2.3.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
GRIDGENA.rsa	531467	591786	527035	531467
gupta1.PSA	1999930	2663283	2335099	2599585
gupta2.PSA	5023260	6306828	–	5267761
gupta3.PSA	4706536	4686893	4727149	4800082
Halfb.PSE	6530841	6530841	6530841	6530841
hood.rsa	5715036	5715036	5715036	5715036
inline.1.rsa	19163744	19163744	19163744	19163744
JNLBRNG1.rsa	325482	372350	328802	325482
ldoor.rsa	24689547	24689547	24689547	24689547
MINSURFO.rsa	331180	383975	334511	331180
msc10848.RSA	631166	631166	631166	631166
msc23052.RSA	611990	611990	611990	611990
M_T1.rsa	5023157	5023157	5023157	5023157
nasasrb.RSA	1421013	1421090	1420972	1421013
OBSTCLAE.rsa	319579	371692	334300	319579
OILPAN.rsa	1909227	1909227	1909227	1909227
onera_dual.kp	921927	1051374	1016170	921927
opt1.PSE	988506	988506	988506	988506
pds10.kp	405435	334195	441182	382411
pkustk01.PSA	522761	522761	522761	522761
pkustk02.PSA	421205	421205	421205	421205
pkustk03.PSA	1660217	1660217	1660217	1660217
pkustk04.PSA	2192720	2192720	2192720	2192751
pkustk05.PSA	1158323	1158323	1158323	1158323
pkustk06.PSA	1350635	1350635	1350635	1350635
pkustk07.PSA	1234697	1234697	1234697	1234697
pkustk08.PSA	1646654	1646654	1646654	1646654
pkustk09.PSA	842765	842765	842765	842765
pkustk10.PSA	2275511	2275511	2275511	2275511
pkustk11.PSA	2740667	2740667	2740667	2740667
pkustk12.PSA	3898143	3898143	3898143	3898143
pkustk13.PSA	3450758	3450758	3450758	3450758
pkustk14.PSA	7646146	7646146	7646146	7646146
pwt.RSA	334616	370081	344105	334616
pwtk.RSA	6144094	6144094	6144102	6144094
ramage02.PSE	1458426	1458504	1458426	1458426
s3dkq4m2.rsa	2546124	2546124	2546124	2546124
s3dkt3m2.rsa	2012409	2012409	2012409	2012409
SHIPSEC1.rsa	4118018	4118018	4118018	4118018
SHIPSEC5.rsa	5326343	5326343	5326343	5326343
SHIPSEC8.rsa	3499083	3499083	3499083	3499083
SHIP_001.rse	2374500	2374500	2374500	2374500
SHIP_003.rsa	4225614	4225614	4225614	4225614
shuttle_eddy.PSA	92368	102750	94268	92368
skirt.PSA	120245	128581	124067	120245
Srb1.PSE	1563467	1563467	1563467	1563467
struct3.PSA	667285	684865	677122	667285
tandem_dual.kp	1014471	1177038	1100390	1014471

Table 2.3.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
tandem_vtx.kp	265804	296750	273412	265804
THREAD.rsa	2279633	2279633	2279633	2279633
TORSION1.rsa	319579	371692	334300	319579
trdheim.PSE	1000814	1000814	1000814	1000814
Troll.PSE	6312740	6312740	6312740	6312740
tsyl201.PSE	1258511	1258511	1258511	1258511
vanbody.rsa	1239062	1239062	1239093	1239062
wathen100.mat	281435	281434	281435	281435
wathen120.mat	337575	338670	337575	337575
X104.rsa	5246393	5246393	5246393	5246393

Table 2.3.11: Total number of reals used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	34424911	20934667	41352936	45576930
audikw_1.rsa	—	—	—	—
barth5.kp	401675	386558	437793	401675
bcsstk25.RSA	1695811	1942333	1956590	1695811
bcsstk29.PSA	2205206	1976462	2325710	2205206
bcsstk30.PSA	4301826	4876910	5203514	4301826
bcsstk31.PSA	6508897	4745720	7935553	6508897
bcsstk32.PSA	5530490	6070238	6588426	5530490
bcsstk36.RSA	3411414	3272796	3574362	3411414
bmw7st_1.rsa	31052801	27776294	32789421	31052801
bmwera_1.rsa	108745632	73280994	122873502	108745632
bodyy4.RSA	700933	553789	742843	700933
bodyy5.RSA	727056	608990	752146	727056
bodyy6.RSA	792256	648227	823061	792256
cf1.RSA	45790977	26002315	60069336	45790977
cf2.RSA	84008847	43100045	126093985	84008847
copter1.kp	3837854	2412610	4043728	3837854
copter2.kp	18391275	11496347	23747081	18391275
crankseg_1.rsa	46936754	37941982	53119702	54114900
crankseg_2.rsa	72394968	47470873	77917951	82546717
crplat2.PSE	3822670	3211114	4740747	3822670
ct20stif.PSA	18607959	11341000	19719489	18607959
CVXBQP1.rsa	8068030	2623074	9192875	8068030
Fcondp2.PSE	59997726	64216101	70560273	59997726
finan512.RSA	8364763	1863676	10632800	8364763
finance256.kp	2947447	926450	8270646	2947447
ford1.kp	346921	353777	357483	346921
ford2.kp	2620531	2774715	3092998	2620531
Fullb.PSE	133407825	86548333	135424951	133407825
gearbox.PSA	58262487	41241440	63827583	58262487
GRIDGENA.rsa	3078986	2868504	3216616	3078986
gupta1.PSA	15049738	50321915	31510992	45861885
gupta2.PSA	50817184	160915656	—	75433850
gupta3.PSA	38361544	40508445	20738388	38063606

Table 2.3.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
Halfb.PSE	78632981	78868967	94770597	78632981
hood.rsa	28516579	29099966	31813698	28516579
inline_1.rsa	238499112	182167478	274998665	319450215
JNLBRNG1.rsa	1130744	1096093	1332043	1130744
ldoor.rsa	170523831	147900241	179119800	170523831
MINSURFO.rsa	1124556	1146439	1288920	1124556
msc10848.RSA	2522517	2434116	2640669	2522517
msc23052.RSA	3317676	3306248	3547123	3317676
M_T1.rsa	36518781	37838043	39261753	36518781
nasasrb.RSA	12689200	11229259	15288722	12689200
OBSTCLAE.rsa	1086458	1032521	1347984	1086458
OILPAN.rsa	11693577	9428328	12333636	11693577
onera_dual.kp	19169985	6853229	20896680	19169985
opt1.PSE	7702363	5527162	8131749	7702363
pds10.kp	6176414	1696013	5900018	5679481
pkustk01.PSA	2358312	2368644	2434233	2358312
pkustk02.PSA	1740063	1697823	1710315	1740063
pkustk03.PSA	10845678	9131304	10754172	10845678
pkustk04.PSA	14719809	10693725	18612147	20372745
pkustk05.PSA	21504864	10418352	22816992	21504864
pkustk06.PSA	26026488	13152123	26210394	26026488
pkustk07.PSA	19788465	10122756	25246152	19788465
pkustk08.PSA	27750252	15234669	30470301	27750252
pkustk09.PSA	6379332	5263557	6708960	6379332
pkustk10.PSA	21181515	18277371	23725236	21181515
pkustk11.PSA	59867400	32254029	69364680	59867400
pkustk12.PSA	17431785	18337356	22149754	17491396
pkustk13.PSA	51075989	35791390	48955478	51075989
pkustk14.PSA	140215687	119154125	156803717	140215687
pwt.RSA	1665153	1416986	1952251	1665153
pwtk.RSA	62545108	50253027	76733082	62545108
ramage02.PSE	39307693	14721161	39903581	39307693
s3dkq4m2.rsa	23694692	19375169	29565794	23694692
s3dkt3m2.rsa	17802050	18167378	24110669	17802050
SHIPSEC1.rsa	51370707	45495717	57018537	51370707
SHIPSEC5.rsa	66436982	64160258	67275284	66436982
SHIPSEC8.rsa	61016640	45297051	72203437	61016640
SHIP_001.rse	19825345	16379218	19266253	19825345
SHIP_003.rsa	101535315	70079971	108894816	101535315
shuttle_eddy.PSA	349161	395611	448663	349161
skirt.PSA	528309	489299	504878	528309
Srb1.PSE	10610271	11222556	12428892	10610271
struct3.PSA	5287825	4884466	5909802	5287825
tandem_dual.kp	16698152	7245268	17169959	16698152
tandem_vtx.kp	3591843	2282838	3890259	3591843
THREAD.rsa	39793188	34813437	50606190	39793188
TORSION1.rsa	1086458	1032521	1347984	1086458
trdheim.PSE	1816263	2280330	1985478	1816263

Table 2.3.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
Troll.PSE	131799813	71591688	150797265	131799813
tsyl201.PSE	9016197	7470189	9185631	9016197
vanbody.rsa	6286326	6656992	6685315	6286326
wathen100.mat	1621946	1742182	2116973	1621946
wathen120.mat	2021147	2200088	2595489	2021147
X104.rsa	26861211	29191881	32577945	26861211

Table 2.3.12: Norm of scaled residuals

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	6.3E-16	6.0E-16	6.2E-16	6.5E-16
audikw_1.rsa	—	—	—	—
barth5.kp	2.6E-16	2.7E-16	2.6E-16	2.6E-16
bcsstk25.RSA	1.6E-16	2.5E-16	2.2E-16	1.6E-16
bcsstk29.PSA	3.3E-16	3.2E-16	3.2E-16	3.3E-16
bcsstk30.PSA	3.9E-16	4.0E-16	4.0E-16	3.9E-16
bcsstk31.PSA	3.5E-16	3.5E-16	3.5E-16	3.5E-16
bcsstk32.PSA	3.1E-16	3.2E-16	3.2E-16	3.1E-16
bcsstk36.RSA	3.7E-16	4.0E-16	3.9E-16	3.7E-16
bmw7st_1.rsa	4.7E-16	7.9E-17	2.1E-17	4.7E-16
bmwcra_1.rsa	4.2E-15	4.3E-15	4.3E-15	4.2E-15
bodyy4.RSA	1.4E-16	1.5E-16	1.4E-16	1.4E-16
bodyy5.RSA	1.3E-16	1.3E-16	1.3E-16	1.3E-16
bodyy6.RSA	1.2E-16	1.2E-16	1.2E-16	1.2E-16
cf1.RSA	1.4E-15	1.3E-15	1.4E-15	1.4E-15
cf2.RSA	6.7E-16	6.3E-16	7.0E-16	6.7E-16
copter1.kp	3.4E-16	3.4E-16	3.3E-16	3.4E-16
copter2.kp	3.7E-16	3.5E-16	3.8E-16	3.7E-16
crankseg_1.rsa	9.0E-16	2.6E-16	3.5E-16	2.6E-16
crankseg_2.rsa	4.3E-16	3.2E-16	5.2E-16	2.0E-16
crplat2.PSE	3.4E-16	3.3E-16	3.5E-16	3.4E-16
ct20stif.PSA	4.0E-16	3.7E-16	3.9E-16	4.0E-16
CVXBQP1.rsa	1.6E-16	1.5E-16	1.6E-16	1.6E-16
Fcondp2.PSE	3.5E-16	3.6E-16	3.6E-16	3.5E-16
finan512.RSA	4.0E-16	3.7E-16	4.1E-16	4.0E-16
finance256.kp	2.4E-16	2.6E-16	2.5E-16	2.4E-16
ford1.kp	2.2E-16	2.2E-16	2.2E-16	2.2E-16
ford2.kp	2.2E-16	2.3E-16	2.2E-16	2.2E-16
Fullb.PSE	3.9E-16	3.7E-16	3.8E-16	3.9E-16
gearbox.PSA	4.4E-16	4.2E-16	4.5E-16	4.4E-16
GRIDGENA.rsa	1.5E-14	1.5E-14	1.4E-14	1.5E-14
gupta1.PSA	4.1E-15	3.7E-15	4.0E-15	4.8E-15
gupta2.PSA	4.6E-15	4.9E-15	—	4.4E-15
gupta3.PSA	1.4E-15	8.0E-16	1.5E-15	1.4E-15
Halfb.PSE	3.5E-16	3.5E-16	3.6E-16	3.5E-16
hood.rsa	4.8E-16	4.9E-16	4.7E-16	4.8E-16
inline_1.rsa	8.0E-16	1.2E-15	1.4E-15	7.9E-16
JNLBRNG1.rsa	5.8E-15	5.8E-15	5.7E-15	5.8E-15

Table 2.3.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
ldoor.rsa	2.6E-16	2.7E-16	2.6E-16	2.6E-16
MINSURFO.rsa	2.8E-15	2.8E-15	2.8E-15	2.8E-15
msc10848.RSA	1.7E-16	2.1E-16	1.6E-16	1.7E-16
msc23052.RSA	3.9E-16	4.0E-16	3.8E-16	3.9E-16
M_T1.rsa	3.1E-16	3.0E-16	3.0E-16	3.1E-16
nasasrb.RSA	3.4E-16	3.8E-16	4.0E-16	3.4E-16
OBSTCLAE.rsa	2.3E-15	2.4E-15	2.4E-15	2.3E-15
OILPAN.rsa	2.2E-16	2.3E-16	2.1E-16	2.2E-16
onera_dual.kp	2.3E-16	2.4E-16	2.3E-16	2.3E-16
opt1.PSE	5.9E-16	5.4E-16	5.7E-16	5.9E-16
pds10.kp	4.0E-16	3.1E-16	3.3E-16	3.7E-16
pkustk01.PSA	3.0E-16	2.9E-16	3.0E-16	3.0E-16
pkustk02.PSA	3.7E-16	3.7E-16	3.7E-16	3.7E-16
pkustk03.PSA	3.0E-16	2.9E-16	3.0E-16	3.0E-16
pkustk04.PSA	6.9E-16	7.2E-16	7.0E-16	7.9E-16
pkustk05.PSA	4.2E-16	3.8E-16	4.3E-16	4.2E-16
pkustk06.PSA	4.2E-16	3.9E-16	4.3E-16	4.2E-16
pkustk07.PSA	6.9E-16	5.6E-16	7.4E-16	6.9E-16
pkustk08.PSA	6.8E-16	5.7E-16	6.9E-16	6.8E-16
pkustk09.PSA	3.0E-16	2.8E-16	3.0E-16	3.0E-16
pkustk10.PSA	3.1E-16	3.0E-16	3.1E-16	3.1E-16
pkustk11.PSA	4.3E-16	3.8E-16	4.2E-16	4.3E-16
pkustk12.PSA	7.8E-16	8.3E-16	8.3E-16	8.1E-16
pkustk13.PSA	5.1E-16	4.9E-16	5.2E-16	5.1E-16
pkustk14.PSA	5.9E-16	5.2E-16	6.3E-16	5.9E-16
pwt.RSA	2.7E-16	2.8E-16	2.7E-16	2.7E-16
pwtk.RSA	5.5E-16	5.7E-16	5.5E-16	5.5E-16
ramage02.PSE	9.4E-16	6.2E-16	8.4E-16	9.4E-16
s3dkq4m2.rsa	4.1E-15	4.1E-15	4.1E-15	4.1E-15
s3dkt3m2.rsa	4.6E-15	4.5E-15	4.4E-15	4.6E-15
SHIPSEC1.rsa	4.7E-16	4.3E-16	5.2E-16	4.7E-16
SHIPSEC5.rsa	7.0E-16	6.6E-16	6.8E-16	7.0E-16
SHIPSEC8.rsa	5.0E-16	4.6E-16	4.5E-16	5.0E-16
SHIP_001.rse	5.6E-16	5.8E-16	5.5E-16	5.6E-16
SHIP_003.rsa	1.1E-15	1.8E-15	1.0E-15	1.1E-15
shuttle_eddy.PS	2.8E-16	2.8E-16	2.7E-16	2.8E-16
skirt.PSA	2.9E-16	3.0E-16	3.0E-16	2.9E-16
Srb1.PSE	3.4E-16	3.3E-16	3.4E-16	3.4E-16
struct3.PSA	3.3E-16	3.3E-16	3.3E-16	3.3E-16
tandem_dual.kp	2.3E-16	2.4E-16	2.4E-16	2.3E-16
tandem_vtx.kp	3.6E-16	3.5E-16	3.6E-16	3.6E-16
THREAD.rsa	2.9E-15	3.0E-15	2.8E-15	2.9E-15
TORSION1.rsa	2.3E-15	2.4E-15	2.4E-15	2.3E-15
trdheim.PSE	4.3E-16	4.3E-16	4.3E-16	4.3E-16
Troll.PSE	4.2E-16	3.9E-16	4.3E-16	4.2E-16
tsyl201.PSE	5.3E-16	5.2E-16	5.2E-16	5.3E-16
vanbody.rsa	2.8E-16	3.7E-16	2.3E-16	2.8E-16
wathen100.mat	1.8E-16	1.8E-16	1.8E-16	1.8E-16

Table 2.3.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
wathen120.mat	1.8E-16	1.8E-16	1.8E-16	1.8E-16
X104.rsa	3.2E-15	3.4E-15	3.2E-15	3.2E-15

Table 2.3.13: Norm of scaled residuals following a single refinement

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
3dtube.PSA	1.2E-16	1.2E-16	1.2E-16	1.2E-16
audikw_1.rsa	–	–	–	–
barth5.kp	9.5E-17	9.6E-17	9.5E-17	9.5E-17
bcsstk25.RSA	1.3E-16	1.4E-16	7.9E-17	1.3E-16
bcsstk29.PSA	8.6E-17	8.7E-17	8.6E-17	8.6E-17
bcsstk30.PSA	1.1E-16	1.1E-16	1.1E-16	1.1E-16
bcsstk31.PSA	8.7E-17	8.8E-17	8.8E-17	8.7E-17
bcsstk32.PSA	8.6E-17	8.6E-17	8.7E-17	8.6E-17
bcsstk36.RSA	3.1E-16	3.4E-16	3.2E-16	3.1E-16
bmw7st_1.rsa	1.9E-16	1.8E-16	1.8E-16	1.9E-16
bmwcra_1.rsa	3.0E-15	3.0E-15	3.0E-15	3.0E-15
bodyy4.RSA	6.9E-17	6.9E-17	7.1E-17	6.9E-17
bodyy5.RSA	7.1E-17	6.8E-17	6.8E-17	7.1E-17
bodyy6.RSA	7.0E-17	6.9E-17	6.7E-17	7.0E-17
cf1.RSA	7.3E-16	7.3E-16	7.2E-16	7.3E-16
cf2.RSA	4.2E-16	4.1E-16	4.2E-16	4.2E-16
copter1.kp	1.0E-16	9.9E-17	1.0E-16	1.0E-16
copter2.kp	1.0E-16	1.0E-16	1.0E-16	1.0E-16
crankseg_1.rsa	1.3E-15	4.1E-16	5.7E-16	6.5E-16
crankseg_2.rsa	1.7E-16	6.8E-16	1.6E-16	5.9E-16
crplat2.PSE	1.1E-16	1.1E-16	1.1E-16	1.1E-16
ct20stif.PSA	9.5E-17	9.3E-17	9.5E-17	9.5E-17
CVXBQP1.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Fcondp2.PSE	1.1E-16	1.1E-16	1.1E-16	1.1E-16
finan512.RSA	1.3E-16	1.3E-16	1.3E-16	1.3E-16
finance256.kp	9.4E-17	9.5E-17	9.4E-17	9.4E-17
ford1.kp	9.1E-17	9.1E-17	9.1E-17	9.1E-17
ford2.kp	9.1E-17	9.2E-17	9.1E-17	9.1E-17
Fullb.PSE	1.1E-16	1.1E-16	1.1E-16	1.1E-16
gearbox.PSA	1.0E-16	1.0E-16	1.0E-16	1.0E-16
GRIDGENA.rsa	1.1E-14	1.1E-14	1.1E-14	1.1E-14
gupta1.PSA	6.7E-17	7.2E-17	7.1E-17	7.7E-17
gupta2.PSA	7.2E-17	7.6E-17	–	7.7E-17
gupta3.PSA	1.0E-16	9.0E-17	1.0E-16	1.1E-16
Halfb.PSE	1.1E-16	1.1E-16	1.1E-16	1.1E-16
hood.rsa	5.7E-16	5.6E-16	5.6E-16	5.7E-16
inline_1.rsa	1.1E-15	9.9E-16	9.9E-16	1.1E-15
JNLBRNG1.rsa	4.8E-15	4.7E-15	4.8E-15	4.8E-15
ldoor.rsa	2.7E-16	2.7E-16	2.7E-16	2.7E-16
MINSURFO.rsa	2.1E-15	2.1E-15	2.1E-15	2.1E-15
msc10848.RSA	1.2E-16	1.1E-16	1.3E-16	1.2E-16

Table 2.3.13: Norm of scaled residuals following a single refinement (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
msc23052.RSA	3.5E-16	3.6E-16	3.6E-16	3.5E-16
M_T1.rsa	3.2E-16	3.3E-16	3.3E-16	3.2E-16
nasasrb.RSA	3.0E-16	2.8E-16	3.0E-16	3.0E-16
OBSTCLAE.rsa	1.9E-15	1.9E-15	1.9E-15	1.9E-15
OILPAN.rsa	2.2E-16	2.3E-16	2.2E-16	2.2E-16
onera_dual.kp	9.1E-17	9.1E-17	9.1E-17	9.1E-17
opt1.PSE	1.8E-16	1.8E-16	1.8E-16	1.8E-16
pds10.kp	9.9E-17	9.7E-17	9.6E-17	9.9E-17
pkustk01.PSA	8.5E-17	8.5E-17	8.6E-17	8.5E-17
pkustk02.PSA	1.0E-16	1.0E-16	1.0E-16	1.0E-16
pkustk03.PSA	8.4E-17	8.2E-17	8.5E-17	8.4E-17
pkustk04.PSA	1.2E-16	1.2E-16	1.2E-16	1.3E-16
pkustk05.PSA	1.0E-16	9.7E-17	1.0E-16	1.0E-16
pkustk06.PSA	1.0E-16	9.8E-17	1.0E-16	1.0E-16
pkustk07.PSA	1.7E-16	1.6E-16	1.8E-16	1.7E-16
pkustk08.PSA	1.7E-16	1.6E-16	1.7E-16	1.7E-16
pkustk09.PSA	8.5E-17	8.2E-17	8.5E-17	8.5E-17
pkustk10.PSA	8.6E-17	8.2E-17	8.6E-17	8.6E-17
pkustk11.PSA	1.0E-16	9.7E-17	1.0E-16	1.0E-16
pkustk12.PSA	1.3E-16	1.3E-16	1.4E-16	1.4E-16
pkustk13.PSA	1.1E-16	1.1E-16	1.2E-16	1.1E-16
pkustk14.PSA	1.4E-16	1.3E-16	1.5E-16	1.4E-16
pwt.RSA	8.5E-17	8.5E-17	8.5E-17	8.5E-17
pwtk.RSA	4.4E-16	4.4E-16	4.3E-16	4.4E-16
ramage02.PSE	2.3E-16	2.0E-16	2.3E-16	2.3E-16
s3dkq4m2.rsa	3.1E-15	3.0E-15	3.1E-15	3.1E-15
s3dkt3m2.rsa	3.1E-15	3.0E-15	3.0E-15	3.1E-15
SHIPSEC1.rsa	2.3E-16	2.4E-16	2.4E-16	2.3E-16
SHIPSEC5.rsa	3.3E-16	3.2E-16	3.2E-16	3.3E-16
SHIPSEC8.rsa	2.2E-16	2.1E-16	2.1E-16	2.2E-16
SHIP_001.rse	4.3E-16	4.4E-16	4.2E-16	4.3E-16
SHIP_003.rsa	7.8E-16	7.4E-16	7.4E-16	7.8E-16
shuttle.eddy.PS	8.5E-17	8.4E-17	8.5E-17	8.5E-17
skirt.PSA	8.5E-17	8.5E-17	8.5E-17	8.5E-17
Srb1.PSE	1.0E-16	1.0E-16	1.0E-16	1.0E-16
struct3.PSA	8.5E-17	8.6E-17	8.5E-17	8.5E-17
tandem_dual.kp	9.1E-17	9.1E-17	9.1E-17	9.1E-17
tandem_vtx.kp	1.0E-16	1.0E-16	1.0E-16	1.0E-16
THREAD.rsa	2.1E-15	2.1E-15	2.1E-15	2.1E-15
TORSION1.rsa	1.9E-15	1.9E-15	1.9E-15	1.9E-15
trdheim.PSE	1.5E-16	1.5E-16	1.5E-16	1.5E-16
Troll.PSE	1.1E-16	1.1E-16	1.1E-16	1.1E-16
tsyl201.PSE	1.8E-16	1.7E-16	1.7E-16	1.8E-16
vanbody.rsa	2.7E-16	2.0E-16	1.6E-16	2.7E-16
wathen100.mat	1.5E-16	1.5E-16	1.5E-16	1.5E-16
wathen120.mat	1.6E-16	1.5E-16	1.5E-16	1.6E-16
X104.rsa	2.0E-15	2.0E-15	2.0E-15	2.0E-15

3 Indefinite matrices

3.1 Test matrices

Our indefinite test matrices come from many of the same sources as the positive definite ones described in Section 2.1. In addition, Mario Arioli (RAL) (MA) generated the Darcy and Stokes examples, Olaf Schenk (Universität Basel) (OS) provided the c-* examples, and Miroslav Tuma (Academy of Sciences of the Czech Republic) (MT) generated the mining examples, while other optimization applications came from the Maros and Mészáros (1999) (M2) quadratic programming (QP) collection. The test set currently comprises 61 numerically indefinite problems.

Table 3.1.1: Indefinite test matrices and their characteristics

Name	n	nnz	Subset?	Application
A0NSDSIL.rsa	80016	200021	✓	Linear Complementarity problem (CUTEr)
A2NNSNSL.rsa	80016	196115	✓	Linear Complementarity problem (CUTEr)
A5ESINDL.rsa	60008	145004	✓	Linear Complementarity problem (CUTEr)
AUG2D.mat	29008	38416		Expanded system—2D PDE (CUTEr)
AUG2DC.mat	30200	40000		Expanded system—2D PDE (CUTEr)
AUG3D.mat	24300	34992		Expanded system—3D PDE (CUTEr)
AUG3DCQP.mat	35543	105372		Expanded system—3D PDE (CUTEr)
bcsstk35.RSA	30237	740200		Stiffness matrix—automobile seat frame (UF)
bcsstk37.RSA	25503	583240		Stiffness matrix—track ball (UF)
bcsstk39.RSA	46772	1068033		Stiffness matrix—shuttle rocket booster (UF)
BLOCKQP1.rsa	60012	340032	✓	QP with block structure (CUTEr)
BLOWEYA.rsa	30004	90006		Cahn-Hilliard problem (CUTEr)
bmw3_2.rsa	227362	5757996	✓	Linear static analysis—car body (PA)
BOYD1.RSA	93279	745507	✓	KKT matrix—Convex QP (CUTEr)
BOYD2.RSA	466316	890093	✓	KKT matrix—Convex QP (CUTEr)
BRAINPC2.rsa	27607	96732		Biological model (CUTEr)
BRATU3D.RSA	27792	88627		3D Bratu problem (CUTEr)
c-55.RSA	32780	218115		Optimization model (OS)
c-58.RSA	37595	295076		Optimization model (OS)
c-59.RSA	41282	260909		Optimization model (OS)
c-62.RSA	41731	300537		Optimization model (OS)
c-63.RSA	44234	239469		Optimization model (OS)
c-68.RSA	64810	315408	✓	Optimization model (OS)
c-69.RSA	67458	345714	✓	Optimization model (OS)
c-70.RSA	68924	363955	✓	Optimization model (OS)
c-71.RSA	76638	468096	✓	Optimization model (OS)
c-72.RSA	84064	395811	✓	Optimization model (OS)
CONT-201.RSA	80595	249996	✓	KKT matrix—Convex QP (M2)
CONT-300.RSA	180895	562496	✓	KKT matrix—Convex QP (M2)
copter2.rsa	55476	407714	✓	Helicopter rotor blade (KP)
crystk02.RSA	13965	491274		Stiffness matrix—crystal free vibration (UF)
crystk03.RSA	24696	887937		Stiffness matrix—crystal free vibration (UF)
DARCY003.rsa	389874	1167685	✓	KKT matrix from Darcy's equation (MA)
dawson5.rsa	51537	531157	✓	Aeroplane actuator system (UF)
DIXMAANL.rsa	60000	179999	✓	Dixon-Maany optimization example (CUTEr)
DTOC.mat	24993	34986		Discrete-time optimal control (CUTEr)
D_PRETOK.rsa	182730	885416	✓	Straz pod Ralskem mine model (MT)
HELM2D03.rsa	392257	1567096	✓	Helmholtz problem (MA)

Table 3.1.1: Indefinite test matrices and their characteristics (continued)

Name	n	nnz	Subset?	Application
HELM3D01.rsa	32226	230335		Helmholtz problem (MA)
K1_SAN.rsa	67759	303364	✓	Straz pod Ralskem mine model (MT)
LINVERSE.rsa	11999	59988		Matrix inverse approximation (CUTEr)
mario001.rsa	38434	114643		Stokes equation (MA)
mario002.rsa	389874	1167685		Stokes equation (MA)
NCVXBQP1.rsa	50000	249984	✓	Nonconvex QP Hessian (CUTEr)
NCVXQP1.mat	12111	47648		KKT matrix—nonconvex QP (CUTEr)
NCVXQP3.rsa	75000	324982	✓	KKT matrix—nonconvex QP (CUTEr)
NCVXQP5.rsa	62500	287481	✓	KKT matrix—nonconvex QP (CUTEr)
NCVXQP7.rsa	87500	362481	✓	KKT matrix—nonconvex QP (CUTEr)
NCVXQP9.mat	16554	31547		KKT matrix—nonconvex QP (CUTEr)
olesnik0.rsa	88263	402623	✓	Straz pod Ralskem mine model (MT)
qa8fk.RSA	66127	863353	✓	FE matrix from 3D acoustics (UF)
SIT100.rsa	10262	34094		Straz pod Ralskem mine model (MT)
SPARSINE.rsa	50000	799494	✓	Structural optimization (CUTEr)
SPMSRTL5.rsa	29995	129971		Sparse matrix square root (CUTEr)
stokes128.mat	49666	295938	✓	Stokes equation (MA)
stokes64.mat	12546	74242		Stokes equation (AW)
stokes64s.mat	12546	74242		Stokes equation (AW)
tuma1.mat	22967	76199		Mine model (MT)
tuma2.mat	12992	42935		Mine model (MT)
TURON_M.rsa	189924	912345	✓	Model of uranium mine (MT)
vibrobox.RSA	12328	177578		Vibroacoustic problem (UF)

3.2 Individual package comparisons

In this section, we report statistics when running the packages outlined in Table 1.1 on the indefinite test set described in Section 3.1. The test environment is identical to that described in Section 2.2, excepting that now numerical pivoting is important and we need to assess the effects of different ordering/pivoting and scaling strategies. Note that MA55 and MA62 were not designed for indefinite problems, and thus are omitted from these tests.

We consider four pivoting strategies. The first (default) is to perform threshold pivoting (see, Duff, Erisman and Reid, 1986, §5.4) with threshold parameter, u , as set by default by the solver (this is $u = 0.1$ for MA27 and MA67, $u = 0.01$ for MA57, and $u = 0.001$ for MA47). The second is again to use threshold pivoting, but this time with a far smaller threshold parameter $u = 10^{-10}$. This has the potential to allow the code to stick closer to the ordering suggested by the analysis phase, but also allows the possibility of large growth. The third and fourth strategies are to pre-scale the matrix (using MC30) to try to equilibrate the entries prior to factorization, and then to use threshold pivoting (with default u and $u = 10^{-10}$, respectively) on the resulting scaled system.

Once again we report the return code from each run, the total CPU time required (as well as separate times for the analyse, factorization and solution phases), the minimum memory that would be required for a successful run along with that actually used, counts of the sizes of integer and real arrays needed to solve the problem (as well as separate counts for those required to hold the factors), and the norms of the residuals $Ax - b$ both following the solution phase and following a single iterative refinement.

A return code of 0 indicates a successful run. Other values include

-99. The CPU limit was reached;

- 13. The normalized residual $\|Ax - b\|/(\|A\|\|x\| + \|b\|)$ exceeded 0.0001 both before and after iterative refinement;
- 2. An allocation error occurred —too much storage was required; and
- 6. The matrix is reported to be singular.

3.2.1 Default runs

Here are the results obtained with the (solver-dependent) default threshold pivoting parameter.

Table 3.2.1.1: Return code

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	0	0	-99	6
AUG2DC.mat	0	0	-99	6
AUG3D.mat	0	0	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	-99	-99	-99	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	-99	-99	-99	-99
BOYD2.RSA	-99	-99	-99	-99
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	0	-99	0	0
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	-99
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	-99
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	-99
c-72.RSA	0	0	0	0
CONT-201.RSA	0	-99	0	0
CONT-300.RSA	0	-99	0	-13
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	0	-99	6
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0

Table 3.2.1.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	0	0	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	-99	0	0
NCVXQP3.rsa	-2	-99	-2	-99
NCVXQP5.rsa	-2	-99	-99	-99
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-2	-2	-99
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0
vibrobox.RSA	0	0	0	0

Table 3.2.1.2: Total time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSL.rsa	23.646	57.897	10.561	34.330
A2NNSNSL.rsa	25.756	49.315	11.474	31.091
A5ESINDL.rsa	6.835	19.422	4.520	23.601
AUG2D.mat	199.667	0.147	—	0.114
AUG2DC.mat	260.533	0.176	—	0.110
AUG3D.mat	917.022	0.304	1012.311	0.087
AUG3DCQP.mat	1.674	1.818	1.310	3.302
bcsstk35.RSA	3.008	2.265	2.238	3.064
bcsstk37.RSA	10.156	3.001	2.638	10.059
bcsstk39.RSA	11.346	7.590	6.419	12.012
BLOCKQP1.rsa	80.964	146.051	27.795	33.231
BLOWEYA.rsa	—	—	—	1993.252
bmw3.2.rsa	843.035	251.186	136.146	521.559
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	—	—	—
BRAINPC2.rsa	1.062	7.228	1.189	10.290
BRATU3D.RSA	232.065	—	157.778	433.343
c-55.RSA	87.467	31.905	20.976	156.410
c-58.RSA	87.514	18.084	20.180	1316.071
c-59.RSA	42.228	20.907	16.787	149.585

Table 3.2.1.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
c-62.RSA	489.628	128.084	61.112	–
c-63.RSA	10.526	8.466	6.044	20.626
c-68.RSA	375.953	80.258	72.258	–
c-69.RSA	14.538	7.000	5.266	68.105
c-70.RSA	44.437	21.888	16.129	202.576
c-71.RSA	612.097	358.622	167.395	–
c-72.RSA	38.014	12.232	8.625	231.374
CONT-201.RSA	19.071	–	18.770	67.452
CONT-300.RSA	87.980	–	76.302	–
copter2.rsa	109.841	89.924	31.863	65.708
crystk02.RSA	15.514	17.361	12.017	15.078
crystk03.RSA	96.417	45.399	24.561	44.015
DARCY003.rsa	9.130	14.717	7.411	18.439
dawson5.rsa	7.235	6.883	4.669	20.497
DIXMAANL.rsa	0.379	0.615	0.501	1.066
DTOC.mat	–	0.234	–	0.104
D_PRETOK.rsa	279.328	189.294	46.652	300.198
HELM2D03.rsa	87.409	72.293	39.054	71.194
HELM3D01.rsa	49.103	40.278	20.162	52.590
K1_SAN.rsa	12.938	11.139	4.044	14.260
LINVERSE.rsa	0.056	0.079	0.061	0.104
mario001.rsa	0.449	0.829	0.443	1.158
mario002.rsa	9.106	14.710	7.414	18.352
NCVXBQP1.rsa	37.939	26.346	9.284	22.834
NCVXQP1.mat	649.740	–	225.327	509.864
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	4.100	175.832	1.068	1.470
olesnik0.rsa	16.836	17.313	6.278	24.301
qa8fk.RSA	661.711	283.263	181.062	471.368
SIT100.rsa	0.924	2.421	1.214	1.445
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	0.151	0.184	0.160	0.255
stokes128.mat	13.009	3.207	4.382	68.869
stokes64.mat	1.388	0.571	0.362	4.252
stokes64s.mat	2.027	0.590	0.595	5.855
tuma1.mat	0.671	0.678	0.427	1.217
tuma2.mat	0.231	0.293	0.167	0.432
TURON_M.rsa	163.806	201.842	41.144	362.016
vibrobox.RSA	83.654	4.604	3.634	73.404

Table 3.2.1.3: Analyse time (CPU seconds)

Name	MA27	MA47	MA57
A0NSDSIL.rsa	23.342	57.621	10.252
A2NNSNSL.rsa	25.462	49.041	11.174

Table 3.2.1.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA57
A5ESINDL.rsa	6.497	19.237	4.311
AUG2D.mat	0.080	0.112	–
AUG2DC.mat	0.085	0.134	–
AUG3D.mat	0.118	0.275	0.080
AUG3DCQP.mat	0.169	0.348	0.137
bcsstk35.RSA	0.320	0.406	0.328
bcsstk37.RSA	0.257	0.347	0.256
bcsstk39.RSA	0.496	0.635	0.514
BLOCKQP1.rsa	80.538	145.737	27.490
BLOWEYA.rsa	–	–	–
bmw3.2.rsa	3.095	3.914	2.795
BOYD1.RSA	–	–	–
BOYD2.RSA	–	–	–
BRAINPC2.rsa	0.960	7.113	1.069
BRATU3D.RSA	0.552	–	0.200
c-55.RSA	1.747	1.566	0.376
c-58.RSA	3.075	2.607	0.670
c-59.RSA	2.085	1.778	0.452
c-62.RSA	4.361	3.527	0.685
c-63.RSA	1.092	1.050	0.379
c-68.RSA	6.035	4.268	0.756
c-69.RSA	1.760	1.647	0.575
c-70.RSA	2.012	1.850	0.616
c-71.RSA	7.544	5.938	1.138
c-72.RSA	2.046	2.069	0.795
CONT-201.RSA	0.466	–	0.363
CONT-300.RSA	1.145	–	0.911
copter2.rsa	1.330	1.950	0.794
crystk02.RSA	0.252	0.338	0.200
crystk03.RSA	0.486	0.664	0.418
DARCY003.rsa	2.554	7.924	2.625
dawson5.rsa	0.678	1.020	0.467
DIXMAANL.rsa	0.174	0.419	0.240
DTOC.mat	0.038	0.202	0.045
D_PRETOK.rsa	1.038	2.941	1.025
HELM2D03.rsa	3.439	5.705	3.218
HELM3D01.rsa	0.833	1.356	0.440
K1_SAN.rsa	0.334	1.053	0.322
LINVERSE.rsa	0.027	0.047	0.031
mario001.rsa	0.146	0.468	0.148
mario002.rsa	2.534	7.945	2.633
NCVXBQP1.rsa	0.543	0.977	0.466
NCVXQP1.mat	0.715	–	0.151
NCVXQP3.rsa	–	–	–
NCVXQP5.rsa	–	–	–
NCVXQP7.rsa	–	–	–
NCVXQP9.mat	0.080	3.149	0.062
olesnik0.rsa	0.488	1.457	0.478

Table 3.2.1.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA57
qa8fk.RSA	2.502	3.602	1.054
SIT100.rsa	0.050	0.131	0.044
SPARSINE.rsa	—	—	—
SPMSRTLS.rsa	0.068	0.103	0.070
stokes128.mat	0.263	0.960	0.258
stokes64.mat	0.061	0.201	0.052
stokes64s.mat	0.061	0.202	0.049
tuma1.mat	0.074	0.143	0.070
tuma2.mat	0.041	0.081	0.042
TURON_M.rsa	1.138	3.343	1.085
vibrobox.RSA	0.325	0.434	0.181

Table 3.2.1.4: Factorize time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSL.rsa	0.274	0.216	0.271	34.283
A2NNSNSL.rsa	0.265	0.214	0.261	31.046
A5ESINDL.rsa	0.317	0.141	0.184	23.566
AUG2D.mat	199.454	0.029	—	0.105
AUG2DC.mat	260.302	0.035	—	0.102
AUG3D.mat	916.547	0.024	1011.736	0.082
AUG3DCQP.mat	1.474	1.420	1.136	3.253
bcsstk35.RSA	2.600	1.771	1.805	2.955
bcsstk37.RSA	9.724	2.562	2.277	9.908
bcsstk39.RSA	10.644	6.745	5.684	11.725
BLOCKQP1.rsa	0.402	0.256	0.276	33.196
BLOWEYA.rsa	—	—	—	1992.278
bmw3.2.rsa	838.186	245.685	131.869	519.378
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	—	—	—
BRAINPC2.rsa	0.096	0.098	0.109	10.273
BRATU3D.RSA	231.108	—	157.183	432.927
c-55.RSA	85.550	30.193	20.474	156.219
c-58.RSA	84.274	15.384	19.433	1315.806
c-59.RSA	40.016	19.012	16.239	149.423
c-62.RSA	484.650	124.160	60.101	—
c-63.RSA	9.355	7.317	5.562	20.517
c-68.RSA	369.456	75.769	71.301	—
c-69.RSA	12.663	5.228	4.593	67.967
c-70.RSA	42.264	19.881	15.370	202.379
c-71.RSA	603.906	352.138	165.762	—
c-72.RSA	35.798	10.006	7.706	231.174
CONT-201.RSA	18.348	—	18.117	66.972
CONT-300.RSA	86.165	—	74.619	—
copter2.rsa	108.139	87.491	30.706	65.255
crystk02.RSA	15.145	16.870	11.674	14.914
crystk03.RSA	95.625	44.416	23.859	43.663

Table 3.2.1.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
DARCY003.rsa	6.242	6.362	4.406	17.862
dawson5.rsa	6.418	5.689	4.057	20.294
DIXMAANL.rsa	0.182	0.153	0.228	1.021
DTOC.mat	–	0.026	–	0.097
D_PRETOK.rsa	277.480	185.280	44.928	298.671
HELM2D03.rsa	83.043	65.447	34.846	69.948
HELM3D01.rsa	48.093	38.696	19.531	52.340
K1_SAN.rsa	12.439	9.871	3.580	14.021
LINVERSE.rsa	0.025	0.025	0.027	0.100
mario001.rsa	0.279	0.332	0.269	1.120
mario002.rsa	6.239	6.341	4.399	17.775
NCVXBQP1.rsa	37.241	25.194	8.688	22.652
NCVXQP1.mat	648.542	–	224.791	509.523
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	3.984	172.634	0.987	1.451
olesnik0.rsa	16.119	15.568	5.602	23.953
qa8fk.RSA	658.133	278.532	179.027	470.020
SIT100.rsa	0.852	2.254	1.137	1.418
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	0.076	0.063	0.079	0.241
stokes128.mat	12.557	2.140	3.989	68.331
stokes64.mat	1.290	0.351	0.293	4.185
stokes64s.mat	1.923	0.369	0.523	5.773
tuma1.mat	0.575	0.509	0.337	1.188
tuma2.mat	0.183	0.201	0.118	0.421
TURON_M.rsa	161.935	197.373	39.397	360.237
vibrobox.RSA	83.167	4.110	3.392	73.214

Table 3.2.1.5: Solution time given factors (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.029	0.061	0.038	0.047
A2NNSNSL.rsa	0.028	0.061	0.039	0.046
A5ESINDL.rsa	0.020	0.045	0.024	0.034
AUG2D.mat	0.133	0.006	–	0.009
AUG2DC.mat	0.146	0.007	–	0.009
AUG3D.mat	0.357	0.004	0.495	0.005
AUG3DCQP.mat	0.031	0.050	0.037	0.049
bcsstk35.RSA	0.088	0.088	0.105	0.108
bcsstk37.RSA	0.176	0.092	0.105	0.150
bcsstk39.RSA	0.206	0.210	0.221	0.287
BLOCKQP1.rsa	0.024	0.058	0.028	0.035
BLOWEYA.rsa	–	–	–	0.974
bmw3_2.rsa	1.754	1.588	1.482	2.180
BOYD1.RSA	–	–	–	–

Table 3.2.1.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
BOYD2.RSA	–	–	–	–
BRAINPC2.rsa	0.006	0.018	0.011	0.017
BRATU3D.RSA	0.405	–	0.395	0.416
c-55.RSA	0.170	0.147	0.127	0.191
c-58.RSA	0.165	0.094	0.077	0.265
c-59.RSA	0.127	0.116	0.097	0.162
c-62.RSA	0.617	0.397	0.313	–
c-63.RSA	0.079	0.099	0.103	0.108
c-68.RSA	0.463	0.222	0.201	–
c-69.RSA	0.116	0.124	0.099	0.139
c-70.RSA	0.162	0.157	0.143	0.196
c-71.RSA	0.640	0.547	0.493	–
c-72.RSA	0.171	0.157	0.124	0.199
CONT-201.RSA	0.258	–	0.290	0.480
CONT-300.RSA	0.670	–	0.772	–
copter2.rsa	0.372	0.483	0.363	0.453
crstk02.RSA	0.118	0.153	0.143	0.164
crstk03.RSA	0.306	0.319	0.284	0.351
DARCY003.rsa	0.334	0.431	0.380	0.577
dawson5.rsa	0.139	0.174	0.145	0.203
DIXMAANL.rsa	0.023	0.043	0.032	0.045
DTOC.mat	2.398	0.006	1.109	0.008
D_PRETOK.rsa	0.810	1.074	0.699	1.527
HELM2D03.rsa	0.926	1.142	0.990	1.246
HELM3D01.rsa	0.177	0.225	0.191	0.250
K1_SAN.rsa	0.165	0.215	0.142	0.239
LINVERSE.rsa	0.003	0.007	0.003	0.005
mario001.rsa	0.023	0.028	0.025	0.037
mario002.rsa	0.334	0.425	0.378	0.577
NCVXBQP1.rsa	0.155	0.175	0.130	0.182
NCVXQP1.mat	0.482	–	0.385	0.342
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.036	0.050	0.019	0.019
olesnik0.rsa	0.229	0.288	0.197	0.348
qa8fk.RSA	1.076	1.128	0.981	1.348
SIT100.rsa	0.022	0.037	0.033	0.027
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.007	0.018	0.011	0.014
stokes128.mat	0.189	0.106	0.136	0.538
stokes64.mat	0.036	0.019	0.018	0.067
stokes64s.mat	0.043	0.020	0.023	0.082
tuma1.mat	0.022	0.025	0.020	0.029
tuma2.mat	0.007	0.011	0.007	0.012
TURON_M.rsa	0.733	1.126	0.662	1.779
vibrobox.RSA	0.162	0.060	0.061	0.190

Table 3.2.1.6: Minimum memory required (Mbytes)

Name	MA57	MA67
A0NSDSIL.rsa	1.4E+01	1.9E+01
A2NNSNSL.rsa	1.3E+01	1.8E+01
A5ESINDL.rsa	9.3E+00	1.4E+01
AUG2D.mat	–	4.6E+00
AUG2DC.mat	–	4.8E+00
AUG3D.mat	2.6E+03	4.0E+00
AUG3DCQP.mat	1.9E+01	2.9E+01
bcsstk35.RSA	4.6E+01	4.8E+01
bcsstk37.RSA	4.5E+01	8.2E+01
bcsstk39.RSA	8.9E+01	1.1E+02
BLOCKQP1.rsa	1.6E+01	2.5E+01
BLOWEYA.rsa	–	2.0E+03
bmw3_2.rsa	7.4E+02	1.1E+03
BOYD1.RSA	–	–
BOYD2.RSA	–	–
BRAINPC2.rsa	5.9E+00	9.1E+00
BRATU3D.RSA	2.9E+02	8.2E+02
c-55.RSA	1.3E+02	1.4E+02
c-58.RSA	9.9E+01	2.3E+02
c-59.RSA	9.1E+01	1.0E+02
c-62.RSA	2.1E+02	–
c-63.RSA	4.7E+01	5.3E+01
c-68.RSA	2.5E+02	–
c-69.RSA	4.6E+01	5.9E+01
c-70.RSA	1.1E+02	1.2E+02
c-71.RSA	4.9E+02	–
c-72.RSA	6.6E+01	9.9E+01
CONT-201.RSA	1.1E+02	2.3E+02
CONT-300.RSA	3.1E+02	–
copter2.rsa	1.6E+02	2.2E+02
crystk02.RSA	8.5E+01	9.7E+01
crystk03.RSA	1.5E+02	2.0E+02
DARCY003.rsa	1.1E+02	1.5E+02
dawson5.rsa	6.3E+01	9.9E+01
DIXMAANL.rsa	1.2E+01	1.6E+01
DTOC.mat	8.5E+02	4.1E+00
D_PRETOK.rsa	2.9E+02	7.1E+02
HELM2D03.rsa	3.3E+02	4.0E+02
HELM3D01.rsa	1.2E+02	2.0E+02
K1_SAN.rsa	5.2E+01	1.0E+02
LINVERSE.rsa	2.7E+00	4.6E+00
mario001.rsa	9.6E+00	1.2E+01
mario002.rsa	1.1E+02	1.5E+02
NCVXBQP1.rsa	7.5E+01	1.1E+02
NCVXQP1.mat	5.4E+02	5.3E+02
NCVXQP3.rsa	–	–
NCVXQP5.rsa	–	–
NCVXQP7.rsa	–	–

Table 3.2.1.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA67
NCVXQP9.mat	1.2E+01	7.8E+00
olesnik0.rsa	7.5E+01	1.5E+02
qa8fk.RSA	4.7E+02	8.1E+02
SIT100.rsa	1.5E+01	1.6E+01
SPARSINE.rsa	—	—
SPMSRTLS.rsa	6.0E+00	8.4E+00
stokes128.mat	4.9E+01	2.6E+02
stokes64.mat	8.2E+00	3.2E+01
stokes64s.mat	9.9E+00	3.8E+01
tuma1.mat	8.7E+00	1.5E+01
tuma2.mat	4.0E+00	6.3E+00
TURON_M.rsa	2.6E+02	7.7E+02
vibrobox.RSA	3.7E+01	2.0E+02

Table 3.2.1.7: Actual memory used (Mbytes)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.4E+01	1.5E+01	1.7E+01	2.6E+01
A2NNSNSL.rsa	1.3E+01	1.5E+01	1.6E+01	2.6E+01
A5ESINDL.rsa	8.9E+00	9.9E+00	1.2E+01	1.9E+01
AUG2D.mat	9.9E+02	3.1E+00	—	5.6E+00
AUG2DC.mat	8.1E+02	3.2E+00	—	5.8E+00
AUG3D.mat	1.5E+03	2.7E+00	3.1E+03	4.8E+00
AUG3DCQP.mat	1.5E+01	2.2E+01	2.1E+01	4.3E+01
bcsstk35.RSA	4.8E+01	4.8E+01	5.4E+01	6.8E+01
bcsstk37.RSA	6.0E+01	4.9E+01	5.1E+01	1.5E+02
bcsstk39.RSA	1.0E+02	1.0E+02	1.0E+02	2.4E+02
BLOCKQP1.rsa	2.7E+01	2.0E+01	2.0E+01	4.5E+01
BLOWEYA.rsa	—	—	—	2.6E+03
bmw3.2.rsa	9.4E+02	8.5E+02	8.1E+02	2.2E+03
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	—	—	—
BRAINPC2.rsa	5.5E+00	7.9E+00	6.8E+00	9.1E+00
BRATU3D.RSA	2.8E+02	—	3.0E+02	1.1E+03
c-55.RSA	1.3E+02	1.4E+02	1.7E+02	3.1E+02
c-58.RSA	1.4E+02	1.1E+02	1.0E+02	2.5E+03
c-59.RSA	9.5E+01	1.2E+02	9.5E+01	1.9E+02
c-62.RSA	3.0E+02	2.9E+02	2.2E+02	—
c-63.RSA	4.0E+01	6.5E+01	5.0E+01	1.4E+02
c-68.RSA	2.4E+02	2.6E+02	3.0E+02	—
c-69.RSA	6.5E+01	5.7E+01	5.0E+01	1.2E+02
c-70.RSA	9.8E+01	1.2E+02	1.1E+02	1.4E+02
c-71.RSA	5.3E+02	6.7E+02	5.1E+02	—
c-72.RSA	9.0E+01	7.4E+01	7.2E+01	2.4E+02
CONT-201.RSA	1.2E+02	—	1.2E+02	3.3E+02
CONT-300.RSA	3.1E+02	—	3.3E+02	—
copter2.rsa	1.9E+02	2.7E+02	1.8E+02	5.0E+02

Table 3.2.1.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA57	MA67
crystk02.RSA	7.2E+01	1.0E+02	9.7E+01	2.0E+02
crystk03.RSA	1.7E+02	1.9E+02	1.7E+02	3.4E+02
DARCY003.rsa	1.1E+02	1.3E+02	1.2E+02	2.2E+02
dawson5.rsa	6.7E+01	7.7E+01	7.1E+01	1.6E+02
DIXMAANL.rsa	1.1E+01	1.2E+01	1.4E+01	2.1E+01
DTOC.mat	6.8E+02	2.7E+00	9.6E+02	5.0E+00
D_PRETOK.rsa	4.1E+02	5.0E+02	3.1E+02	9.8E+02
HELM2D03.rsa	3.4E+02	4.2E+02	3.6E+02	5.4E+02
HELM3D01.rsa	9.7E+01	1.5E+02	1.3E+02	2.8E+02
K1_SAN.rsa	7.1E+01	8.8E+01	5.7E+01	1.8E+02
LINVERSE.rsa	2.5E+00	3.3E+00	3.2E+00	6.2E+00
mario001.rsa	9.5E+00	1.1E+01	1.1E+01	2.2E+01
mario002.rsa	1.1E+02	1.3E+02	1.2E+02	2.2E+02
NCVXBQP1.rsa	7.0E+01	1.2E+02	7.9E+01	1.4E+02
NCVXQP1.mat	5.2E+02	—	6.5E+02	1.9E+03
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.8E+01	2.7E+01	1.4E+01	1.6E+01
olesnik0.rsa	9.2E+01	1.2E+02	8.3E+01	2.4E+02
qa8fk.RSA	5.5E+02	5.6E+02	5.3E+02	1.0E+03
SIT100.rsa	8.7E+00	2.5E+01	1.8E+01	2.6E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	5.8E+00	7.3E+00	7.1E+00	1.0E+01
stokes128.mat	8.3E+01	3.8E+01	5.5E+01	3.2E+02
stokes64.mat	1.4E+01	8.6E+00	9.8E+00	4.4E+01
stokes64s.mat	1.9E+01	1.0E+01	1.1E+01	4.4E+01
tuma1.mat	9.4E+00	1.2E+01	9.8E+00	3.0E+01
tuma2.mat	4.5E+00	6.2E+00	4.7E+00	1.0E+01
TURON_M.rsa	3.1E+02	5.2E+02	2.9E+02	1.0E+03
vibrobox.RSA	9.5E+01	4.1E+01	3.8E+01	4.0E+02

Table 3.2.1.8: Number of integers used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	409788	165033	504335	493673
A2NNSNSL.rsa	391596	165264	479341	476319
A5ESINDL.rsa	329327	135003	350816	332139
AUG2D.mat	236054	86439	—	86439
AUG2DC.mat	255342	90003	—	90003
AUG3D.mat	305974	64155	319170	64155
AUG3DCQP.mat	204293	142825	237346	240119
bcsstk35.RSA	231308	215475	227325	254255
bcsstk37.RSA	218582	191672	205511	244347
bcsstk39.RSA	409702	385098	395732	527808
BLOCKQP1.rsa	380004	190021	399890	400017
BLOWEYA.rsa	—	—	—	332330

Table 3.2.1.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA57	MA67
bmw3_2.rsa	2207466	1978680	2090696	2616786
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	—	—	—
BRAINPC2.rsa	83088	55228	83077	170701
BRATU3D.RSA	410112	—	397474	1270077
c-55.RSA	461461	241149	428362	1516222
c-58.RSA	555813	271014	569919	3049635
c-59.RSA	511021	269472	495022	1604707
c-62.RSA	706946	342798	596276	—
c-63.RSA	414836	227247	422720	678641
c-68.RSA	987341	448189	754355	—
c-69.RSA	563205	317111	589952	1635724
c-70.RSA	640212	337962	634941	2211098
c-71.RSA	1258109	605518	1024174	—
c-72.RSA	735714	383059	725965	2549163
CONT-201.RSA	676018	—	644445	1383920
CONT-300.RSA	1547177	—	1472588	—
copter2.rsa	806591	515679	837861	976401
crystk02.RSA	182504	146351	173257	208115
crystk03.RSA	330928	271630	317983	381597
DARCY003.rsa	1962217	2282010	1937373	2839115
dawson5.rsa	549365	346585	561998	693774
DIXMAANL.rsa	349686	129998	459063	365847
DTOC.mat	—	84974	—	84974
D_PRETOK.rsa	1376678	1541866	1310111	2338974
HELM2D03.rsa	3623311	2135055	3744078	3758365
HELM3D01.rsa	469914	262038	480955	517528
K1_SAN.rsa	469512	529356	442161	684470
LINVERSE.rsa	41992	21999	41989	42185
mario001.rsa	189632	219498	186966	270134
mario002.rsa	1962217	2282010	1937373	2839115
NCVXBQP1.rsa	499982	285054	516541	557248
NCVXQP1.mat	321142	—	293966	980571
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	104141	673155	100104	133585
olesnik0.rsa	624095	711098	581867	981832
qa8fk.RSA	1539848	886262	1861292	1499241
SIT100.rsa	76563	56159	79632	92553
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	118968	54991	129892	123124
stokes128.mat	387420	597313	344595	740420
stokes64.mat	93185	143708	78983	169752
stokes64s.mat	97616	144696	84083	173010
tuma1.mat	127257	77363	122997	141409
tuma2.mat	69929	42231	67108	76921
TURON_M.rsa	1394013	1622955	1339403	2448253

Table 3.2.1.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA57	MA67
vibrobox.RSA	198677	110574	211980	264759

Table 3.2.1.9: Total number of integers used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	464972	400042	505049	1870292
A2NNSNSL.rsa	435954	392230	482995	1850762
A5ESINDL.rsa	280012	290008	350841	1429995
AUG2D.mat	147351	106044	–	540163
AUG2DC.mat	153655	110408	–	562387
AUG3D.mat	145750	89432	296000	465323
AUG3DCQP.mat	205903	210744	239406	930426
bcsstk35.RSA	740239	1480400	770442	1843254
bcsstk37.RSA	583264	1166480	608748	1472526
bcsstk39.RSA	1068081	2136066	1114810	2697340
BLOCKQP1.rsa	620028	680064	420062	2140539
BLOWEYA.rsa	–	–	–	932544
bmw3.2.rsa	5758017	11515992	5985363	14244346
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	–	–	–
BRAINPC2.rsa	138042	193464	152074	980112
BRATU3D.RSA	406367	–	404795	3344656
c-55.RSA	468480	436230	444074	2676664
c-58.RSA	548100	590152	586846	4136593
c-59.RSA	514229	521818	505343	2513010
c-62.RSA	687191	601074	623553	–
c-63.RSA	422291	478938	427913	1639696
c-68.RSA	910381	630816	769893	–
c-69.RSA	572678	691428	593859	2428408
c-70.RSA	639584	727910	645741	2949623
c-71.RSA	1238837	936192	1053523	–
c-72.RSA	728498	791622	731660	3393619
CONT-201.RSA	737107	–	647388	3056204
CONT-300.RSA	1676247	–	1477617	–
copter2.rsa	857863	815428	862482	3892822
crystk02.RSA	491313	982548	505244	1150138
crystk03.RSA	887976	1775874	912638	2072236
DARCY003.rsa	2310376	2335370	1939303	10041316
dawson5.rsa	578306	1062314	582864	3238063
DIXMAANL.rsa	350000	359998	459088	1500006
DTOC.mat	–	94977	–	474851
D.PRETOK.rsa	1582490	1770832	1319045	6361531
HELM2D03.rsa	3629422	3134192	3752224	13057600
HELM3D01.rsa	495891	460670	494980	2208783
K1_SAN.rsa	551990	606728	444879	2236029
LINVERSE.rsa	59988	119976	71992	395853
mario001.rsa	223874	229286	187570	985686

Table 3.2.1.9: Total number of integers used (continued)

Name	MA27	MA47	MA57	MA67
mario002.rsa	2310376	2335370	1939303	10041316
NCVXBQP1.rsa	508195	499968	518934	1549847
NCVXQP1.mat	217435	—	306684	4563990
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	88993	674305	101266	365399
olesnik0.rsa	722127	805246	585695	2950222
qa8fk.RSA	1584913	1726706	1892539	9102363
SIT100.rsa	85967	68188	82109	286196
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129987	259942	159976	669884
stokes128.mat	447306	601962	362008	2148065
stokes64.mat	110599	148484	90904	530686
stokes64s.mat	110599	148484	90904	530686
tuma1.mat	142924	152398	124164	527334
tuma2.mat	78235	85870	67737	297580
TURON_M.rsa	1634660	1824690	1348714	7829609
vibrobox.RSA	226089	355156	224011	928621

Table 3.2.1.10: Number of reals used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	345317	677578	344433	355434
A2NNSNSL.rsa	331666	663023	327247	338235
A5ESINDL.rsa	317369	370027	231428	231168
AUG2D.mat	6510270	57624	—	57624
AUG2DC.mat	7693508	60000	—	60000
AUG3D.mat	18854488	46656	20253212	46656
AUG3DCQP.mat	1003605	1172812	958196	1250820
bcsstk35.RSA	2945599	2863548	2734087	3072402
bcsstk37.RSA	4577064	3169486	2934743	4778532
bcsstk39.RSA	7852736	7286742	6688230	9082570
BLOCKQP1.rsa	380081	880042	380113	380079
BLOWEYA.rsa	—	—	—	50653540
bmw3_2.rsa	82871350	59975104	55605822	84255391
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	—	—	—
BRAINPC2.rsa	234550	298557	234334	210625
BRATU3D.RSA	22200458	—	18208464	19772597
c-55.RSA	7706392	5780863	5328923	6668377
c-58.RSA	7424529	2851815	2611332	9280590
c-59.RSA	5379460	4024601	3595058	4548094
c-62.RSA	24486396	11811077	11235017	—
c-63.RSA	2819281	2896788	2544000	2731938
c-68.RSA	16302275	8202770	8309760	—
c-69.RSA	4296100	3182477	2694692	3582695
c-70.RSA	6181749	4872763	4830380	5624556

Table 3.2.1.10: Number of reals used for factors (continued)

Name	MA27	MA47	MA57	MA67
c-71.RSA	30270388	23749456	21912782	–
c-72.RSA	6518717	4049194	3408205	5260451
CONT-201.RSA	12072341	–	10375113	16959646
CONT-300.RSA	32483186	–	28895511	–
copter2.rsa	17514277	19346520	14143112	16982273
crystk02.RSA	5852382	6352770	6098260	6544392
crystk03.RSA	14710431	13702950	11904216	14905712
DARCY003.rsa	7629544	7918169	6941313	8506429
dawson5.rsa	5259864	5566247	4627722	6560301
DIXMAANL.rsa	350876	509986	340125	375765
DTOC.mat	–	54980	–	54980
D_PRETOK.rsa	37673183	41041539	24794239	59946042
HELM2D03.rsa	31687519	34710614	28015811	31592323
HELM3D01.rsa	8186645	9031106	7631962	9884968
K1.SAN.rsa	6629530	7203450	4285569	7786387
LINVERSE.rsa	54056	77976	54019	54289
mario001.rsa	582494	574826	529699	594051
mario002.rsa	7629544	7918169	6941313	8506429
NCVXBQP1.rsa	6119583	6018075	4150853	5538742
NCVXQP1.mat	23440182	–	21836443	15999080
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1525642	1039613	628980	422284
olesnik0.rsa	9011136	9617331	6063534	11218082
qa8fk.RSA	51388343	46649779	40901710	58263681
SIT100.rsa	838987	1464589	1142476	914844
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	130961	194979	130231	155485
stokes128.mat	8118892	2825207	4324931	20125798
stokes64.mat	1409878	569713	615357	2439897
stokes64s.mat	1794536	607794	806760	3112944
tuma1.mat	693312	684422	536696	789430
tuma2.mat	301584	329845	224637	305011
TURON_M.rsa	31255527	43299541	23280502	59792105
vibrobox.RSA	8176651	2329429	2318439	8412768

Table 3.2.1.11: Total number of reals used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	519807	677865	450038	800085
A2NNSNSL.rsa	463110	661253	409414	784461
A5ESINDL.rsa	249980	360092	249997	580017
AUG2D.mat	270709	76832	–	153657
AUG2DC.mat	288181	80000	–	159993
AUG3D.mat	693600	69984	328977068	139553
AUG3DCQP.mat	1243294	2076189	1726268	2801360
bcsstk35.RSA	2969697	3140370	2990750	3481407

Table 3.2.1.11: Total number of reals used (continued)

Name	MA27	MA47	MA57	MA67
bcsstk37.RSA	3174983	3856247	3393685	8308247
bcsstk39.RSA	8094097	8114804	7106639	10348218
BLOCKQP1.rsa	1700035	870300	420242	1200099
BLOWEYA.rsa	–	–	–	251309324
bmw3_2.rsa	64274845	80806888	71633596	121258788
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	–	–	–
BRAINPC2.rsa	158766	290140	234620	386536
BRATU3D.RSA	11015132	–	35536699	100349935
c-55.RSA	8416233	12951098	14872578	15984800
c-58.RSA	7111004	8195130	10978067	26142609
c-59.RSA	5752783	10412354	10182405	11227893
c-62.RSA	15646102	27583891	24537188	–
c-63.RSA	3404098	5794086	4734398	5204668
c-68.RSA	11870180	23830112	29066279	–
c-69.RSA	3892702	4676793	4091738	5336805
c-70.RSA	5737156	11035334	11564616	12210543
c-71.RSA	36194417	63886587	59434116	–
c-72.RSA	4799099	7493513	6313905	9699064
CONT-201.RSA	4407324	–	12232421	26235986
CONT-300.RSA	11731238	–	35087658	–
copter2.rsa	19867719	30649794	18400990	24127302
crystk02.RSA	6517207	10186953	8827118	10523420
crystk03.RSA	16703368	19664285	15713960	21585232
DARCY003.rsa	6652597	8955365	7562066	9973627
dawson5.rsa	5599303	7092148	5754777	9614923
DIXMAANL.rsa	350020	510123	380038	719997
DTOC.mat	–	69972	–	139943
D_PRETOK.rsa	34869093	56522384	31424089	82996810
HELM2D03.rsa	33319047	42566587	32569973	39185470
HELM3D01.rsa	9972738	17174765	13763575	22822416
K1.SAN.rsa	6647640	9114340	4999323	10545277
LINVERSE.rsa	71987	119976	60021	221909
mario001.rsa	495098	674595	575236	715587
mario002.rsa	6652597	8955365	7562066	9973627
NCVXBQP1.rsa	6844070	13514185	8077213	12890351
NCVXQP1.mat	4084959	–	66952875	63287572
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	171887	2020271	1301967	687273
olesnik0.rsa	8601487	12505019	7453295	16379505
qa8fk.RSA	58388401	63045819	55505819	94431201
SIT100.rsa	810208	2496715	1694083	1704767
SPARSINE.rsa	–	–	–	–
SPMSRTL5.rsa	159966	259942	130097	379919
stokes128.mat	3083370	3321082	4801209	30442359
stokes64.mat	599167	697734	689142	3552442

Table 3.2.1.11: Total number of reals used (continued)

Name	MA27	MA47	MA57	MA67
stokes64s.mat	599167	736828	908780	4287055
tuma1.mat	697398	1051911	687742	1458662
tuma2.mat	299148	511882	277035	524731
TURON_M.rsa	32364595	58962913	28481724	89611095
vibrobox.RSA	3443649	4266057	3887771	24232679

Table 3.2.1.12: Norm of scaled residuals

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.3E-15	1.4E-15	1.6E-15	2.4E-15
A2NNSNSL.rsa	4.2E-16	4.4E-16	1.2E-15	4.1E-16
A5ESINDL.rsa	6.2E-16	1.6E-15	6.1E-16	2.6E-16
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.1E-16	1.1E-16	1.1E-16	1.1E-16
bcsstk35.RSA	5.8E-16	3.1E-16	4.6E-16	1.1E-16
bcsstk37.RSA	1.9E-15	1.2E-15	1.2E-15	1.2E-15
bcsstk39.RSA	4.9E-16	2.5E-16	2.4E-16	2.9E-16
BLOCKQP1.rsa	1.2E-12	1.9E-13	1.2E-12	1.2E-12
BLOWEYA.rsa	–	–	–	2.0E-14
bmw3_2.rsa	3.7E-16	2.8E-16	6.6E-16	5.5E-16
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	–	–	–
BRAINPC2.rsa	4.7E-15	6.2E-13	1.8E-14	1.2E-14
BRATU3D.RSA	5.6E-13	–	9.9E-10	1.6E-12
c-55.RSA	7.6E-17	1.2E-16	4.7E-17	5.5E-17
c-58.RSA	5.0E-16	4.9E-15	4.3E-15	5.9E-16
c-59.RSA	2.9E-15	1.1E-15	9.2E-17	4.1E-16
c-62.RSA	2.9E-16	1.3E-16	5.1E-16	–
c-63.RSA	4.2E-17	2.8E-16	6.2E-17	4.3E-17
c-68.RSA	4.5E-15	9.8E-16	5.5E-16	–
c-69.RSA	1.0E-17	2.7E-17	1.3E-17	2.0E-17
c-70.RSA	1.3E-17	2.2E-17	1.3E-17	1.3E-17
c-71.RSA	3.0E-16	1.8E-16	1.7E-16	–
c-72.RSA	2.9E-17	5.3E-17	5.8E-17	1.3E-17
CONT-201.RSA	1.3E-13	–	2.4E-11	4.0E-13
CONT-300.RSA	1.6E-13	–	2.3E-11	–
copter2.rsa	3.1E-13	3.2E-12	1.8E-12	9.3E-14
crystk02.RSA	4.8E-15	3.5E-15	2.3E-15	3.2E-15
crystk03.RSA	6.3E-15	4.6E-15	2.8E-15	4.1E-15
DARCY003.rsa	3.8E-15	3.1E-15	1.8E-15	4.6E-15
dawson5.rsa	6.1E-14	7.6E-13	2.1E-13	4.7E-14
DIXMAANL.rsa	1.6E-16	4.0E-15	6.7E-16	2.7E-16
DTOC.mat	3.9E-16	3.9E-16	4.0E-16	3.9E-16
D_PRETOK.rsa	1.4E-15	3.4E-14	1.6E-15	5.2E-16
HELM2D03.rsa	7.2E-13	1.7E-12	1.1E-12	1.5E-13
HELM3D01.rsa	1.5E-13	1.6E-12	4.8E-13	7.0E-14

Table 3.2.1.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA57	MA67
K1_SAN.rsa	2.8E-14	1.2E-14	4.2E-15	8.1E-15
LINVERSE.rsa	1.7E-16	1.8E-16	4.9E-16	2.5E-16
mario001.rsa	3.0E-15	2.1E-15	1.1E-15	2.1E-15
mario002.rsa	3.8E-15	3.1E-15	1.8E-15	4.6E-15
NCVXBQP1.rsa	3.5E-15	5.2E-13	2.9E-14	1.5E-15
NCVXQP1.mat	6.4E-16	–	2.8E-16	3.3E-16
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1.1E-16	1.1E-16	1.1E-16	1.1E-16
olesnik0.rsa	2.4E-14	9.3E-15	7.6E-15	1.6E-14
qa8fk.RSA	6.0E-14	3.5E-14	1.7E-14	9.5E-14
SIT100.rsa	2.1E-15	3.3E-15	2.3E-15	4.1E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	3.8E-16	1.3E-14	2.3E-15	4.2E-16
stokes128.mat	3.1E-14	9.1E-14	1.8E-14	1.3E-12
stokes64.mat	1.8E-14	4.3E-14	7.2E-14	1.0E-13
stokes64s.mat	1.2E-14	1.4E-14	2.9E-15	2.5E-15
tuma1.mat	6.7E-15	1.3E-15	2.9E-15	6.9E-16
tuma2.mat	9.6E-15	2.1E-15	3.8E-15	5.6E-16
TURON_M.rsa	7.3E-14	7.3E-15	4.1E-15	8.5E-15
vibrobox.RSA	7.4E-16	2.9E-16	3.4E-16	4.2E-16

Table 3.2.1.13: Norm of scaled residuals following a single refinement

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	6.9E-17	1.3E-16	6.2E-17	1.3E-16
A2NNSNSL.rsa	5.3E-17	1.4E-16	4.6E-17	7.2E-17
A5ESINDL.rsa	1.4E-16	7.4E-17	8.0E-17	9.6E-17
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.2E-17	1.2E-17	1.3E-17	1.2E-17
bcsstk35.RSA	1.8E-16	2.8E-16	2.9E-16	2.1E-16
bcsstk37.RSA	9.6E-16	9.5E-16	9.6E-16	8.9E-16
bcsstk39.RSA	2.0E-16	2.0E-16	1.9E-16	2.0E-16
BLOCKQP1.rsa	2.4E-15	4.8E-14	4.9E-14	4.9E-14
BLOWEYA.rsa	–	–	–	5.5E-15
bmw3.2.rsa	1.7E-16	2.7E-16	1.7E-16	1.7E-16
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	–	–	–
BRAINPC2.rsa	5.2E-16	6.4E-16	9.0E-16	8.3E-16
BRATU3D.RSA	9.7E-16	–	1.1E-15	9.2E-16
c-55.RSA	8.4E-18	3.8E-18	5.0E-18	4.1E-18
c-58.RSA	5.6E-17	1.1E-15	1.1E-15	1.3E-16
c-59.RSA	5.6E-16	5.5E-16	3.2E-16	4.5E-16
c-62.RSA	1.1E-16	9.0E-17	3.2E-16	–

Table 3.2.1.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA57	MA67
c-63.RSA	8.2E-18	1.6E-17	6.8E-18	9.3E-18
c-68.RSA	3.9E-17	3.3E-17	3.3E-17	–
c-69.RSA	1.1E-17	9.7E-18	5.1E-19	1.5E-17
c-70.RSA	1.9E-18	2.5E-18	4.3E-18	1.4E-18
c-71.RSA	9.3E-17	6.5E-17	7.5E-17	–
c-72.RSA	2.4E-18	2.9E-18	1.7E-18	2.1E-18
CONT-201.RSA	1.9E-15	–	2.1E-15	1.6E-15
CONT-300.RSA	2.2E-15	–	2.2E-15	–
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.5E-15	1.5E-15	1.5E-15	1.5E-15
crystk03.RSA	1.9E-15	1.7E-15	1.9E-15	1.8E-15
DARCY003.rsa	9.8E-17	9.9E-17	9.3E-17	1.0E-16
dawson5.rsa	2.2E-16	2.2E-16	2.2E-16	2.2E-16
DIXMAANL.rsa	9.5E-17	1.0E-16	9.6E-17	9.5E-17
DTOC.mat	1.7E-15	1.7E-15	1.7E-15	1.3E-14
D_PRETOK.rsa	5.2E-16	1.3E-16	9.4E-17	9.3E-17
HELM2D03.rsa	3.6E-15	3.6E-15	3.6E-15	3.6E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.8E-16	1.9E-16
K1_SAN.rsa	1.2E-16	1.1E-16	1.1E-16	1.1E-16
LINVERSE.rsa	9.7E-17	9.5E-17	9.7E-17	9.5E-17
mario001.rsa	8.2E-17	9.3E-17	8.6E-17	9.7E-17
mario002.rsa	9.8E-17	9.9E-17	9.3E-17	1.0E-16
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.1E-16	–	1.1E-16	1.1E-16
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	4.4E-24	7.9E-24	1.3E-23	1.3E-23
olesnik0.rsa	9.5E-17	1.0E-16	9.2E-17	8.9E-17
qa8fk.RSA	1.7E-14	7.6E-15	5.4E-15	1.1E-13
SIT100.rsa	3.4E-16	4.8E-16	2.2E-16	2.5E-16
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	1.2E-16	1.3E-16	1.3E-16	1.2E-16
stokes128.mat	1.2E-14	7.8E-14	9.1E-15	7.6E-11
stokes64.mat	1.3E-14	4.2E-14	4.7E-13	5.3E-13
stokes64s.mat	6.2E-14	2.6E-14	1.5E-15	1.5E-15
tuma1.mat	7.8E-17	7.4E-17	7.5E-17	7.6E-17
tuma2.mat	7.7E-17	7.6E-17	7.2E-17	7.3E-17
TURON_M.rsa	2.1E-15	1.3E-16	1.3E-16	2.9E-16
vibrobox.RSA	1.4E-16	1.2E-16	1.2E-16	1.1E-16

3.2.2 Runs with small threshold pivot tolerance

Here are the results obtained with small ($u = 10^{-10}$) threshold pivoting parameter.

Table 3.2.2.1: Return code

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0	0	0	0

Table 3.2.2.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	0	0	-99	6
AUG2DC.mat	0	0	-99	6
AUG3D.mat	0	0	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	0	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	-13	-13	-13	-13
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	0
c-72.RSA	0	0	0	0
CONT-201.RSA	-13	-99	-13	0
CONT-300.RSA	-13	-99	-13	0
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	0	-99	6
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	0	0	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	-99	0	0
NCVXQP3.rsa	0	-99	0	-99
NCVXQP5.rsa	0	0	0	-99
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0

Table 3.2.2.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
olesnik0.rsa	-13	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-2	-2	-99
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	-13	0
vibrobox.RSA	0	0	0	0

Table 3.2.2.2: Total time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSL.rsa	23.725	57.896	10.556	29.776
A2NNSNSL.rsa	25.719	49.308	11.447	27.577
A5ESINDL.rsa	6.673	19.403	4.501	16.711
AUG2D.mat	199.172	0.142	—	0.103
AUG2DC.mat	260.046	0.173	—	0.108
AUG3D.mat	917.911	0.303	1011.255	0.088
AUG3DCQP.mat	1.673	1.793	1.290	2.985
bcsstk35.RSA	2.914	2.268	2.214	2.732
bcsstk37.RSA	3.377	2.837	2.477	3.141
bcsstk39.RSA	11.279	7.572	6.330	12.180
BLOCKQP1.rsa	76.651	146.086	27.813	32.982
BLOWEYA.rsa	2.780	1.649	1.755	4.573
bmw3.2.rsa	402.041	240.437	122.075	295.955
BOYD1.RSA	567.462	657.517	173.722	486.159
BOYD2.RSA	1455.451	2166.410	1578.594	2541.182
BRAINPC2.rsa	1.052	7.211	1.170	2.590
BRATU3D.RSA	—	—	—	—
c-55.RSA	48.674	27.597	18.342	41.722
c-58.RSA	17.129	16.520	18.837	20.983
c-59.RSA	23.516	18.280	14.865	40.000
c-62.RSA	161.492	106.045	55.696	116.100
c-63.RSA	7.994	7.557	5.203	10.338
c-68.RSA	99.434	63.804	57.426	149.589
c-69.RSA	8.573	6.287	4.757	10.460
c-70.RSA	25.002	18.204	14.455	25.571
c-71.RSA	376.529	307.011	152.513	386.964
c-72.RSA	12.860	11.069	7.974	19.052
CONT-201.RSA	—	—	—	7.648
CONT-300.RSA	—	—	—	24.694
copter2.rsa	110.946	89.901	31.830	71.561
crystk02.RSA	15.457	17.338	12.002	15.095

Table 3.2.2.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
crystk03.RSA	96.232	45.428	24.642	44.021
DARCY003.rsa	9.038	14.720	7.432	18.798
dawson5.rsa	7.299	6.875	4.671	17.472
DIXMAANL.rsa	0.375	0.607	0.490	1.068
DTOC.mat	–	0.235	–	0.092
D_PRETOK.rsa	230.014	188.211	46.194	232.174
HELM2D03.rsa	87.478	72.412	39.170	70.950
HELM3D01.rsa	49.717	40.324	20.041	33.642
K1_SAN.rsa	12.579	11.188	4.035	13.805
LINVERSE.rsa	0.054	0.081	0.061	0.111
mario001.rsa	0.444	0.831	0.442	1.124
mario002.rsa	9.052	14.724	7.412	18.404
NCVXBQP1.rsa	27.939	26.442	9.178	12.261
NCVXQP1.mat	117.833	–	58.927	115.093
NCVXQP3.rsa	3243.067	–	1200.383	–
NCVXQP5.rsa	812.881	609.937	353.587	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.289	6.625	0.281	0.688
olesnik0.rsa	–	17.299	6.271	19.899
qa8fk.RSA	656.782	282.732	180.672	470.650
SIT100.rsa	0.751	1.636	0.864	1.527
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.146	0.184	0.167	0.195
stokes128.mat	3.113	3.183	1.839	7.745
stokes64.mat	0.434	0.575	0.336	1.286
stokes64s.mat	0.437	0.571	0.330	1.288
tuma1.mat	0.671	0.680	0.427	1.321
tuma2.mat	0.232	0.291	0.163	0.571
TURON_M.rsa	162.365	202.033	–	223.921
vibrobox.RSA	7.798	4.602	2.932	10.549

Table 3.2.2.3: Analyse time (CPU seconds)

Name	MA27	MA47	MA57
A0NSDSIL.rsa	23.430	57.617	10.253
A2NNSNSL.rsa	25.434	49.025	11.150
A5ESINDL.rsa	6.492	19.222	4.309
AUG2D.mat	0.085	0.106	–
AUG2DC.mat	0.086	0.134	–
AUG3D.mat	0.118	0.273	0.080
AUG3DCQP.mat	0.167	0.343	0.124
bcsstk35.RSA	0.339	0.411	0.324
bcsstk37.RSA	0.264	0.342	0.270
bcsstk39.RSA	0.496	0.630	0.513
BLOCKQP1.rsa	76.231	145.770	27.507
BLOWEYA.rsa	2.689	1.564	1.649
bmw3_2.rsa	3.089	3.920	2.814

Table 3.2.2.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA57
BOYD1.RSA	566.901	657.118	105.587
BOYD2.RSA	1454.118	2165.002	871.005
BRAINPC2.rsa	0.959	7.112	1.070
BRATU3D.RSA	—	—	—
c-55.RSA	1.744	1.555	0.377
c-58.RSA	3.071	2.580	0.665
c-59.RSA	2.076	1.775	0.529
c-62.RSA	4.363	3.356	0.679
c-63.RSA	1.093	1.052	0.373
c-68.RSA	5.990	4.276	0.678
c-69.RSA	1.764	1.648	0.572
c-70.RSA	2.007	1.843	0.614
c-71.RSA	7.501	5.934	1.140
c-72.RSA	2.035	2.090	0.774
CONT-201.RSA	—	—	—
CONT-300.RSA	—	—	—
copter2.rsa	1.385	1.950	0.752
crystk02.RSA	0.252	0.339	0.199
crystk03.RSA	0.489	0.666	0.418
DARCY003.rsa	2.542	7.940	2.649
dawson5.rsa	0.677	1.019	0.470
DIXMAANL.rsa	0.171	0.412	0.231
DTOC.mat	0.036	0.201	—
D_PRETOK.rsa	1.034	2.927	1.002
HELM2D03.rsa	3.484	5.714	3.250
HELM3D01.rsa	0.834	1.349	0.445
K1_SAN.rsa	0.333	1.048	0.309
LINVERSE.rsa	0.025	0.049	0.030
mario001.rsa	0.146	0.468	0.147
mario002.rsa	2.548	7.927	2.639
NCVXBQP1.rsa	0.543	0.979	0.461
NCVXQP1.mat	0.713	—	0.142
NCVXQP3.rsa	31.542	—	2.106
NCVXQP5.rsa	6.862	117.718	1.203
NCVXQP7.rsa	—	—	—
NCVXQP9.mat	0.079	3.150	0.062
olesnik0.rsa	—	1.455	0.470
qa8fk.RSA	2.504	3.610	1.075
SIT100.rsa	0.048	0.126	0.043
SPARSINE.rsa	—	—	—
SPMSRTLS.rsa	0.064	0.104	0.082
stokes128.mat	0.274	0.954	0.230
stokes64.mat	0.061	0.202	0.053
stokes64s.mat	0.063	0.201	0.049
tuma1.mat	0.076	0.143	0.075
tuma2.mat	0.041	0.081	0.039
TURON_M.rsa	1.147	3.331	—
vibrobox.RSA	0.317	0.428	0.176

Table 3.2.2.4: Factorize time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.267	0.219	0.265	29.729
A2NNSNSL.rsa	0.257	0.219	0.258	27.531
A5ESINDL.rsa	0.164	0.139	0.169	16.678
AUG2D.mat	198.962	0.030	–	0.096
AUG2DC.mat	259.814	0.033	–	0.101
AUG3D.mat	917.439	0.025	1010.674	0.083
AUG3DCQP.mat	1.475	1.401	1.130	2.937
bcsstk35.RSA	2.481	1.769	1.795	2.622
bcsstk37.RSA	3.020	2.406	2.103	3.040
bcsstk39.RSA	10.571	6.730	5.596	11.793
BLOCKQP1.rsa	0.394	0.259	0.277	32.948
BLOWEYA.rsa	0.082	0.071	0.095	4.559
bmw3_2.rsa	397.595	234.952	117.855	294.238
BOYD1.RSA	0.512	0.312	67.655	486.081
BOYD2.RSA	1.183	1.016	706.424	2540.889
BRAINPC2.rsa	0.085	0.083	0.090	2.573
BRATU3D.RSA	–	–	–	–
c-55.RSA	46.802	25.897	17.848	41.586
c-58.RSA	13.990	13.849	18.105	20.906
c-59.RSA	21.333	16.388	14.242	39.892
c-62.RSA	156.823	102.355	54.728	115.816
c-63.RSA	6.832	6.411	4.745	10.240
c-68.RSA	93.257	59.322	56.558	149.390
c-69.RSA	6.725	4.520	4.087	10.351
c-70.RSA	22.878	16.203	13.706	25.430
c-71.RSA	368.551	300.552	150.912	386.422
c-72.RSA	10.719	8.825	7.083	18.915
CONT-201.RSA	–	–	–	7.478
CONT-300.RSA	–	–	–	24.240
copter2.rsa	109.194	87.463	30.715	71.092
crystk02.RSA	15.086	16.846	11.660	14.931
crystk03.RSA	95.437	44.443	23.935	43.671
DARCY003.rsa	6.163	6.354	4.405	18.221
dawson5.rsa	6.482	5.689	4.055	17.276
DIXMAANL.rsa	0.181	0.153	0.229	1.022
DTOC.mat	–	0.028	–	0.085
D_PRETOK.rsa	228.230	184.215	44.482	230.875
HELM2D03.rsa	83.071	65.565	34.953	69.708
HELM3D01.rsa	48.703	38.750	19.406	33.424
K1_SAN.rsa	12.085	9.925	3.582	13.570
LINVERSE.rsa	0.025	0.025	0.027	0.106
mario001.rsa	0.274	0.333	0.270	1.088
mario002.rsa	6.169	6.372	4.396	17.824
NCVXBQP1.rsa	27.253	25.287	8.589	12.106
NCVXQP1.mat	116.942	–	58.620	115.016
NCVXQP3.rsa	3209.284	–	1196.533	–
NCVXQP5.rsa	805.036	491.511	351.516	–
NCVXQP7.rsa	–	–	–	–

Table 3.2.2.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
NCVXQP9.mat	0.203	3.466	0.209	0.678
olesnik0.rsa	–	15.556	5.603	19.571
qa8fk.RSA	653.169	277.988	178.629	469.300
SIT100.rsa	0.683	1.478	0.797	1.499
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.074	0.063	0.075	0.183
stokes128.mat	2.744	2.124	1.510	7.597
stokes64.mat	0.356	0.355	0.268	1.259
stokes64s.mat	0.356	0.352	0.266	1.261
tuma1.mat	0.574	0.510	0.332	1.289
tuma2.mat	0.183	0.200	0.117	0.556
TURON_M.rsa	160.521	197.577	–	222.366
vibrobox.RSA	7.419	4.114	2.701	10.481

Table 3.2.2.5: Solution time given factors (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.027	0.061	0.038	0.047
A2NNSNSL.rsa	0.028	0.063	0.039	0.046
A5ESINDL.rsa	0.017	0.042	0.023	0.033
AUG2D.mat	0.125	0.006	–	0.008
AUG2DC.mat	0.146	0.006	–	0.008
AUG3D.mat	0.354	0.004	0.501	0.005
AUG3DCQP.mat	0.031	0.050	0.036	0.048
bcsstk35.RSA	0.095	0.089	0.095	0.110
bcsstk37.RSA	0.093	0.090	0.103	0.101
bcsstk39.RSA	0.212	0.212	0.221	0.387
BLOCKQP1.rsa	0.025	0.058	0.029	0.034
BLOWEYA.rsa	0.008	0.015	0.011	0.014
bmw3_2.rsa	1.357	1.565	1.406	1.718
BOYD1.RSA	0.049	0.086	0.480	0.078
BOYD2.RSA	0.150	0.391	1.165	0.293
BRAINPC2.rsa	0.008	0.016	0.011	0.018
BRATU3D.RSA	–	–	–	–
c-55.RSA	0.128	0.145	0.117	0.136
c-58.RSA	0.067	0.091	0.067	0.077
c-59.RSA	0.106	0.116	0.095	0.108
c-62.RSA	0.295	0.334	0.289	0.284
c-63.RSA	0.069	0.094	0.085	0.098
c-68.RSA	0.187	0.206	0.189	0.198
c-69.RSA	0.085	0.119	0.098	0.108
c-70.RSA	0.117	0.159	0.135	0.142
c-71.RSA	0.470	0.524	0.460	0.542
c-72.RSA	0.105	0.154	0.117	0.137
CONT-201.RSA	–	–	–	0.170
CONT-300.RSA	–	–	–	0.454
copter2.rsa	0.367	0.488	0.363	0.469

Table 3.2.2.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
crystk02.RSA	0.119	0.153	0.142	0.164
crystk03.RSA	0.305	0.319	0.289	0.350
DARCY003.rsa	0.332	0.427	0.379	0.577
dawson5.rsa	0.140	0.167	0.145	0.196
DIXMAANL.rsa	0.023	0.042	0.029	0.046
DTOC.mat	1.418	0.006	–	0.007
D_PRETOK.rsa	0.751	1.069	0.710	1.299
HELM2D03.rsa	0.922	1.133	0.967	1.242
HELM3D01.rsa	0.180	0.225	0.190	0.218
K1_SAN.rsa	0.161	0.215	0.143	0.234
LINVERSE.rsa	0.003	0.007	0.004	0.005
mario001.rsa	0.023	0.029	0.024	0.036
mario002.rsa	0.333	0.425	0.377	0.581
NCVXBQP1.rsa	0.143	0.176	0.129	0.155
NCVXQP1.mat	0.178	–	0.165	0.077
NCVXQP3.rsa	2.167	–	1.696	–
NCVXQP5.rsa	0.983	0.708	0.868	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.007	0.010	0.010	0.010
olesnik0.rsa	–	0.287	0.197	0.328
qa8fk.RSA	1.108	1.133	0.968	1.350
SIT100.rsa	0.020	0.032	0.023	0.028
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.008	0.017	0.010	0.013
stokes128.mat	0.096	0.105	0.099	0.147
stokes64.mat	0.017	0.018	0.015	0.027
stokes64s.mat	0.018	0.018	0.015	0.027
tuma1.mat	0.021	0.026	0.020	0.031
tuma2.mat	0.008	0.010	0.007	0.015
TURON_M.rsa	0.698	1.125	–	1.555
vibrobox.RSA	0.062	0.060	0.056	0.067

Table 3.2.2.6: Minimum memory required (Mbytes)

Name	MA57	MA67
A0NSDSIL.rsa	1.4E+01	1.9E+01
A2NNSNSL.rsa	1.3E+01	1.8E+01
A5ESINDL.rsa	9.2E+00	1.4E+01
AUG2D.mat	–	4.6E+00
AUG2DC.mat	–	4.8E+00
AUG3D.mat	2.6E+03	4.0E+00
AUG3DCQP.mat	1.9E+01	2.5E+01
bcsstk35.RSA	4.6E+01	4.6E+01
bcsstk37.RSA	4.4E+01	4.5E+01
bcsstk39.RSA	8.9E+01	1.1E+02
BLOCKQP1.rsa	1.6E+01	2.5E+01
BLOWEYA.rsa	5.1E+00	8.1E+00

Table 3.2.2.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA67
bmw3_2.rsa	7.0E+02	9.8E+02
BOYD1.RSA	2.5E+02	5.6E+01
BOYD2.RSA	1.5E+03	9.2E+01
BRAINPC2.rsa	5.8E+00	9.2E+00
BRATU3D.RSA	–	–
c-55.RSA	1.1E+02	1.3E+02
c-58.RSA	9.0E+01	7.1E+01
c-59.RSA	8.4E+01	9.9E+01
c-62.RSA	1.9E+02	2.7E+02
c-63.RSA	4.3E+01	5.4E+01
c-68.RSA	2.0E+02	2.3E+02
c-69.RSA	4.3E+01	5.5E+01
c-70.RSA	9.9E+01	1.2E+02
c-71.RSA	4.6E+02	5.6E+02
c-72.RSA	6.3E+01	8.7E+01
CONT-201.RSA	–	6.6E+01
CONT-300.RSA	–	1.7E+02
copter2.rsa	1.6E+02	2.3E+02
crystk02.RSA	8.5E+01	9.7E+01
crystk03.RSA	1.5E+02	2.0E+02
DARCY003.rsa	1.1E+02	1.5E+02
dawson5.rsa	6.3E+01	9.4E+01
DIXMAANL.rsa	1.2E+01	1.6E+01
DTOC.mat	–	4.1E+00
D_PRETOK.rsa	2.8E+02	5.8E+02
HELM2D03.rsa	3.3E+02	4.0E+02
HELM3D01.rsa	1.2E+02	1.5E+02
K1_SAN.rsa	5.2E+01	9.6E+01
LINVERSE.rsa	2.7E+00	4.6E+00
mario001.rsa	9.6E+00	1.2E+01
mario002.rsa	1.1E+02	1.5E+02
NCVXBQP1.rsa	7.5E+01	8.4E+01
NCVXQP1.mat	1.9E+02	7.4E+01
NCVXQP3.rsa	1.4E+03	–
NCVXQP5.rsa	7.3E+02	–
NCVXQP7.rsa	–	–
NCVXQP9.mat	5.2E+00	3.4E+00
olesnik0.rsa	7.5E+01	1.3E+02
qa8fk.RSA	4.7E+02	8.1E+02
SIT100.rsa	1.2E+01	1.6E+01
SPARSINE.rsa	–	–
SPMSRTLS.rsa	6.0E+00	8.4E+00
stokes128.mat	3.4E+01	6.0E+01
stokes64.mat	7.6E+00	1.2E+01
stokes64s.mat	7.6E+00	1.2E+01
tuma1.mat	8.7E+00	1.6E+01
tuma2.mat	4.0E+00	8.3E+00
TURON_M.rsa	–	5.7E+02

Table 3.2.2.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA67
vibrobox.RSA	3.3E+01	6.3E+01

Table 3.2.2.7: Actual memory used (Mbytes)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.4E+01	1.5E+01	1.7E+01	2.6E+01
A2NNSNSL.rsa	1.3E+01	1.5E+01	1.6E+01	2.6E+01
A5ESINDL.rsa	8.8E+00	9.9E+00	1.1E+01	1.9E+01
AUG2D.mat	9.9E+02	3.1E+00	–	5.6E+00
AUG2DC.mat	8.1E+02	3.2E+00	–	5.8E+00
AUG3D.mat	1.5E+03	2.7E+00	3.1E+03	4.8E+00
AUG3DCQP.mat	1.5E+01	2.2E+01	2.1E+01	4.3E+01
bcsstk35.RSA	4.7E+01	4.8E+01	5.4E+01	6.8E+01
bcsstk37.RSA	4.4E+01	4.9E+01	4.9E+01	8.1E+01
bcsstk39.RSA	1.0E+02	1.0E+02	1.0E+02	2.4E+02
BLOCKQP1.rsa	2.7E+01	2.0E+01	2.0E+01	4.5E+01
BLOWEYA.rsa	4.9E+00	5.5E+00	6.5E+00	9.9E+00
bmw3_2.rsa	7.2E+02	8.5E+02	8.0E+02	1.3E+03
BOYD1.RSA	3.1E+01	3.8E+01	2.6E+02	1.2E+02
BOYD2.RSA	5.6E+01	6.8E+01	1.5E+03	1.3E+02
BRAINPC2.rsa	5.3E+00	5.9E+00	6.9E+00	9.1E+00
BRATU3D.RSA	–	–	–	–
c-55.RSA	8.3E+01	1.1E+02	1.2E+02	2.6E+02
c-58.RSA	7.4E+01	7.5E+01	9.9E+01	1.7E+02
c-59.RSA	6.1E+01	9.0E+01	9.0E+01	2.9E+02
c-62.RSA	1.5E+02	2.3E+02	2.2E+02	7.0E+02
c-63.RSA	3.9E+01	5.3E+01	4.8E+01	8.0E+01
c-68.RSA	1.2E+02	1.9E+02	2.0E+02	1.5E+03
c-69.RSA	4.5E+01	4.9E+01	5.0E+01	1.2E+02
c-70.RSA	6.5E+01	9.7E+01	1.1E+02	2.2E+02
c-71.RSA	3.3E+02	5.0E+02	5.0E+02	2.1E+03
c-72.RSA	5.5E+01	7.4E+01	7.0E+01	1.3E+02
CONT-201.RSA	–	–	–	1.2E+02
CONT-300.RSA	–	–	–	2.6E+02
copter2.rsa	1.9E+02	2.7E+02	1.8E+02	5.0E+02
crystk02.RSA	7.2E+01	1.0E+02	9.7E+01	2.0E+02
crystk03.RSA	1.7E+02	1.9E+02	1.7E+02	3.4E+02
DARCY003.rsa	1.1E+02	1.3E+02	1.2E+02	2.2E+02
dawson5.rsa	6.6E+01	7.7E+01	7.1E+01	1.6E+02
DIXMAANL.rsa	1.1E+01	1.2E+01	1.4E+01	2.1E+01
DTOC.mat	6.9E+02	2.7E+00	–	5.0E+00
D_PRETOK.rsa	3.4E+02	5.0E+02	3.1E+02	9.8E+02
HELM2D03.rsa	3.4E+02	4.2E+02	3.6E+02	5.4E+02
HELM3D01.rsa	9.7E+01	1.5E+02	1.3E+02	2.8E+02
K1_SAN.rsa	7.1E+01	8.8E+01	5.7E+01	1.8E+02
LINVERSE.rsa	2.5E+00	3.3E+00	3.2E+00	7.0E+00
mario001.rsa	9.5E+00	1.1E+01	1.1E+01	2.2E+01

Table 3.2.2.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA57	MA67
mario002.rsa	1.1E+02	1.3E+02	1.2E+02	2.2E+02
NCVXBQP1.rsa	7.0E+01	1.2E+02	7.9E+01	1.3E+02
NCVXQP1.mat	1.4E+02	—	1.9E+02	2.8E+02
NCVXQP3.rsa	1.2E+03	—	1.5E+03	—
NCVXQP5.rsa	5.7E+02	2.4E+03	8.4E+02	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	4.5E+00	5.2E+00	6.1E+00	4.9E+00
olesnik0.rsa	—	1.2E+02	8.3E+01	2.4E+02
qa8fk.RSA	5.5E+02	5.6E+02	5.3E+02	1.0E+03
SIT100.rsa	8.6E+00	1.8E+01	1.4E+01	2.2E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	5.8E+00	7.3E+00	7.1E+00	8.5E+00
stokes128.mat	3.9E+01	3.8E+01	3.6E+01	1.4E+02
stokes64.mat	8.2E+00	8.6E+00	8.4E+00	2.0E+01
stokes64s.mat	8.2E+00	8.6E+00	8.4E+00	2.0E+01
tuma1.mat	9.4E+00	1.2E+01	9.8E+00	2.9E+01
tuma2.mat	4.5E+00	6.2E+00	4.7E+00	1.6E+01
TURON_M.rsa	3.1E+02	5.2E+02	—	1.0E+03
vibrobox.RSA	3.6E+01	4.1E+01	3.6E+01	1.2E+02

Table 3.2.2.8: Number of integers used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSL.rsa	420005	165033	499964	499235
A2NNSNSL.rsa	400462	165264	476517	483981
A5ESINDL.rsa	274998	135003	335003	337813
AUG2D.mat	236054	86439	—	86439
AUG2DC.mat	255342	90003	—	90003
AUG3D.mat	305974	64155	319170	64155
AUG3DCQP.mat	204350	142864	237520	239049
bcsstk35.RSA	230149	215475	227235	231841
bcsstk37.RSA	206951	190363	204333	210022
bcsstk39.RSA	409702	385098	395732	527808
BLOCKQP1.rsa	380005	190021	399890	400020
BLOWEYA.rsa	130000	108010	140001	143894
bmw3.2.rsa	2130669	1976217	2080336	2138986
BOYD1.RSA	745513	242571	435270	849522
BOYD2.RSA	1729444	890092	2140797	2200919
BRAINPC2.rsa	138009	89693	151810	189725
BRATU3D.RSA	—	—	—	—
c-55.RSA	453823	243314	432974	436571
c-58.RSA	533917	271936	571050	551905
c-59.RSA	502095	271025	500207	497492
c-62.RSA	664042	345693	605110	634817
c-63.RSA	417254	229076	428798	431128
c-68.RSA	892684	450128	754158	754632
c-69.RSA	567090	319410	600132	601234

Table 3.2.2.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA57	MA67
c-70.RSA	631664	340126	647169	668120
c-71.RSA	1211609	609157	1033717	1100112
c-72.RSA	722279	385637	738899	746547
CONT-201.RSA	–	–	–	786995
CONT-300.RSA	–	–	–	1786393
copter2.rsa	846016	515896	841598	868835
crystk02.RSA	182504	146351	173257	208115
crystk03.RSA	330928	271630	317983	381597
DARCY003.rsa	1962217	2282010	1937373	2837030
dawson5.rsa	570294	346612	564145	630796
DIXMAANL.rsa	349980	129997	459959	365002
DTOC.mat	–	84974	–	84974
D_PRETOK.rsa	1347193	1536798	1305394	2345207
HELM2D03.rsa	3623306	2135055	3744078	3754474
HELM3D01.rsa	482630	262051	482270	478550
K1_SAN.rsa	469070	529356	442337	668775
LINVERSE.rsa	41992	21999	41989	41994
mario001.rsa	189632	219498	186966	269570
mario002.rsa	1962217	2282010	1937373	2837030
NCVXBQP1.rsa	502641	285057	517265	511422
NCVXQP1.mat	252109	–	232708	610246
NCVXQP3.rsa	2524772	–	2084285	–
NCVXQP5.rsa	1210196	1171050	1230776	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	82124	112249	91814	120789
olesnik0.rsa	–	711098	581713	987325
qa8fk.RSA	1539848	886262	1861292	1499241
SIT100.rsa	80949	61243	85906	91858
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	119975	54990	129970	129975
stokes128.mat	317322	597022	306893	616798
stokes64.mat	78407	143789	76565	149774
stokes64s.mat	78407	144243	76565	149462
tuma1.mat	127257	77363	122997	141361
tuma2.mat	69924	42231	67108	77995
TURON_M.rsa	1393905	1622954	–	2394722
vibrobox.RSA	216697	110574	217871	204590

Table 3.2.2.9: Number of reals used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	340031	677578	340046	339250
A2NNSNSL.rsa	324392	663023	324407	327900
A5ESINDL.rsa	215002	369991	215002	217814
AUG2D.mat	6510270	57624	–	57624
AUG2DC.mat	7693508	60000	–	60000
AUG3D.mat	18854488	46656	20253212	46656
AUG3DCQP.mat	1003491	1172866	958084	1155605

Table 3.2.2.9: Number of reals used for factors (continued)

Name	MA27	MA47	MA57	MA67
bcsstk35.RSA	2878066	2863548	2730502	2890987
bcsstk37.RSA	3004411	3077446	2824145	3058994
bcsstk39.RSA	7852736	7286742	6688229	9082570
BLOCKQP1.rsa	380068	880041	380113	380068
BLOWEYA.rsa	140006	120008	140008	109174
bmw3_2.rsa	59778457	59314849	52963147	65082920
BOYD1.RSA	652378	839309	26694808	663069
BOYD2.RSA	1263167	2709386	61603776	1268311
BRAINPC2.rsa	158697	224263	158695	165589
BRATU3D.RSA	—	—	—	—
c-55.RSA	5168011	5431197	4712382	5419598
c-58.RSA	2365903	2680683	2270842	2401958
c-59.RSA	3279860	3765547	3285590	3528907
c-62.RSA	10933899	11223776	10464882	11744648
c-63.RSA	2376334	2680826	2290982	2432551
c-68.RSA	6178885	7229548	6504445	6678823
c-69.RSA	2696315	2974070	2434497	2759767
c-70.RSA	4234877	4530495	4393890	4548089
c-71.RSA	20207062	22262175	20184253	23249327
c-72.RSA	3306942	3878417	3161838	3622251
CONT-201.RSA	—	—	—	4606386
CONT-300.RSA	—	—	—	12660460
copter2.rsa	17227168	19345989	14132982	17723567
crystk02.RSA	5852382	6352770	6098260	6544392
crystk03.RSA	14710431	13702950	11904216	14905712
DARCY003.rsa	7629544	7918169	6941313	8490941
dawson5.rsa	5211272	5566107	4624921	6288239
DIXMAANL.rsa	349980	509964	339981	374962
DTOC.mat	—	54980	—	54980
D.PRETOK.rsa	33445303	40888390	24522476	49655323
HELM2D03.rsa	31686809	34710612	28015793	31611947
HELM3D01.rsa	8145267	9030108	7629570	7901089
K1.SAN.rsa	6567121	7203450	4282567	7648608
LINVERSE.rsa	53988	77976	53988	53988
mario001.rsa	582494	574826	529699	579309
mario002.rsa	7629544	7918169	6941313	8490941
NCVXBQP1.rsa	5375688	6018010	4141288	4259239
NCVXQP1.mat	8966173	—	8477084	2629573
NCVXQP3.rsa	95798699	—	78881102	—
NCVXQP5.rsa	38278060	25734567	38990831	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	279973	117103	262694	116505
olesnik0.rsa	—	9617331	6061585	10291436
qa8fk.RSA	51388343	46649779	40901710	58263681
SIT100.rsa	732809	1188064	869620	981779
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129971	194950	129971	129971
stokes128.mat	3362745	2790225	2714396	4366306

Table 3.2.2.9: Number of reals used for factors (continued)

Name	MA27	MA47	MA57	MA67
stokes64.mat	664992	561964	557892	766887
stokes64s.mat	664992	562995	557892	767042
tuma1.mat	693312	684421	536123	870141
tuma2.mat	301225	329844	224253	388380
TURON_M.rsa	31248580	43299472	–	48514131
vibrobox.RSA	2672558	2329429	2086588	2680747

Table 3.2.2.10: Total number of integers used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	464972	400042	505049	1870292
A2NNSNSL.rsa	435954	392230	482995	1850762
A5ESINDL.rsa	280012	290008	340016	1429995
AUG2D.mat	147351	106044	–	540163
AUG2DC.mat	153655	110408	–	562387
AUG3D.mat	145750	89432	296000	465323
AUG3DCQP.mat	205903	210744	239580	928152
bcsstk35.RSA	740239	1480400	770442	1843254
bcsstk37.RSA	583264	1166480	608748	1472526
bcsstk39.RSA	1068081	2136066	1114810	2697340
BLOCKQP1.rsa	620028	680064	420062	2140515
BLOWEYA.rsa	140022	220027	150024	860093
bmw3.2.rsa	5758017	11515992	5985363	14244346
BOYD1.RSA	746195	1491014	838820	5327874
BOYD2.RSA	1765077	1822733	2288358	10009309
BRAINPC2.rsa	138042	193464	207060	993692
BRATU3D.RSA	–	–	–	–
c-55.RSA	468480	436230	448582	1907580
c-58.RSA	548100	590152	587826	1851305
c-59.RSA	514229	521818	510453	1835673
c-62.RSA	687191	601074	632337	3053609
c-63.RSA	422291	478938	433938	1639696
c-68.RSA	910381	630816	769246	4110048
c-69.RSA	572678	691428	604002	2402825
c-70.RSA	639584	727910	657874	2509026
c-71.RSA	1238837	936192	1062901	5226587
c-72.RSA	728498	791622	744548	2819634
CONT-201.RSA	–	–	–	2952146
CONT-300.RSA	–	–	–	6675664
copter2.rsa	857863	815428	866219	3897168
crystk02.RSA	491313	982548	505244	1150138
crystk03.RSA	887976	1775874	912638	2072236
DARCY003.rsa	2310376	2335370	1939303	10041316
dawson5.rsa	578306	1062314	582864	3177130
DIXMAANL.rsa	350000	359998	459984	1500006
DTOC.mat	–	94977	–	474851
D_PRETOK.rsa	1582490	1770832	1314317	6361531

Table 3.2.2.10: Total number of integers used (continued)

Name	MA27	MA47	MA57	MA67
HELM2D03.rsa	3629422	3134192	3752224	13057600
HELM3D01.rsa	495891	460670	496295	2209271
K1_SAN.rsa	551990	606728	445053	2236029
LINVERSE.rsa	59988	119976	71992	395853
mario001.rsa	223874	229286	187570	985686
mario002.rsa	2310376	2335370	1939303	10041316
NCVXBQP1.rsa	508195	499968	519658	1549847
NCVXQP1.mat	217435	–	243536	2147178
NCVXQP3.rsa	2363420	–	2119970	–
NCVXQP5.rsa	1236448	1435737	1258063	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	88993	123180	92584	351705
olesnik0.rsa	–	805246	585541	2950222
qa8fk.RSA	1584913	1726706	1892539	9102363
SIT100.rsa	85967	68188	88317	312481
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	129987	259942	159976	669884
stokes128.mat	447306	601680	362008	2798569
stokes64.mat	110599	148484	90904	628112
stokes64s.mat	110599	148484	90904	628112
tuma1.mat	142924	152398	124164	527334
tuma2.mat	78235	85870	67737	297580
TURON_M.rsa	1634660	1824690	–	6573196
vibrobox.RSA	226089	355156	230085	928621

Table 3.2.2.11: Total number of reals used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	519807	677865	450038	800085
A2NNSNSL.rsa	463110	661253	409414	784461
A5ESINDL.rsa	249980	360092	249997	580017
AUG2D.mat	270709	76832	–	153657
AUG2DC.mat	288181	80000	–	159993
AUG3D.mat	693600	69984	328977068	139553
AUG3DCQP.mat	1243294	2076270	1726157	2402233
bcsstk35.RSA	2969697	3140370	2987166	3324375
bcsstk37.RSA	3174983	3727194	3264551	3700846
bcsstk39.RSA	8094097	8114804	7106639	10348218
BLOCKQP1.rsa	1700035	870300	420242	1200099
BLOWEYA.rsa	130012	180012	140055	330022
bmw3.2.rsa	64274845	79696068	66435660	103198108
BOYD1.RSA	838786	1491014	28289564	2662498
BOYD2.RSA	1542938	2585368	182449799	3520619
BRAINPC2.rsa	158766	224472	193323	386536
BRATU3D.RSA	–	–	–	–
c-55.RSA	8416233	12055150	13203567	14867810
c-58.RSA	7111004	7663565	9943532	7308464
c-59.RSA	5752783	9663910	9261228	10783179

Table 3.2.2.11: Total number of reals used (continued)

Name	MA27	MA47	MA57	MA67
c-62.RSA	15646102	25997746	22871375	31269656
c-63.RSA	3404098	5354438	4258834	5300571
c-68.RSA	11870180	20895325	23456529	25363266
c-69.RSA	3892702	4396108	3726913	4785859
c-70.RSA	5737156	10165741	10583360	12464317
c-71.RSA	36194417	59759819	54825009	66633947
c-72.RSA	4799099	7166448	5866470	8402131
CONT-201.RSA	–	–	–	6026006
CONT-300.RSA	–	–	–	16891608
copter2.rsa	19867719	30649328	18391275	26272687
crystk02.RSA	6517207	10186953	8827118	10523420
crystk03.RSA	16703368	19664285	15713960	21585232
DARCY003.rsa	6652597	8955365	7562066	10027459
dawson5.rsa	5599303	7092053	5752363	8949371
DIXMAANL.rsa	350020	510117	380038	719997
DTOC.mat	–	69972	–	139943
D_PRETOK.rsa	34869093	56362875	31140627	67553488
HELM2D03.rsa	33319047	42566587	32569973	39205259
HELM3D01.rsa	9972738	17173791	13761359	16877181
K1_SAN.rsa	6647640	9114340	4996624	10097300
LINVERSE.rsa	71987	119976	60021	221909
mario001.rsa	495098	674595	575236	666267
mario002.rsa	6652597	8955365	7562066	10027459
NCVXBQP1.rsa	6844070	13514155	8068030	9048759
NCVXQP1.mat	4084959	–	22959582	8099807
NCVXQP3.rsa	72921247	–	176822509	–
NCVXQP5.rsa	42371340	199448789	88843236	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	171887	211647	423137	146712
olesnik0.rsa	–	12505019	7451672	13285361
qa8fk.RSA	58388401	63045819	55505819	94431201
SIT100.rsa	810208	2030853	1306438	1779371
SPARSINE.rsa	–	–	–	–
SPMSRTL5.rsa	159966	259942	130005	379919
stokes128.mat	3083370	3286175	2946251	5401628
stokes64.mat	599167	690187	622493	1050344
stokes64s.mat	599167	691218	622493	985449
tuma1.mat	697398	1051911	687742	1491761
tuma2.mat	299148	511882	277035	774708
TURON_M.rsa	32364595	58962908	–	66114396
vibrobox.RSA	3443649	4266057	3408950	7063315

Table 3.2.2.12: Norm of scaled residuals

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	8.4E-16	1.4E-15	3.5E-15	2.6E-15
A2NNSNSL.rsa	8.6E-16	4.4E-16	9.8E-16	2.9E-15
A5ESINDL.rsa	7.2E-15	1.8E-14	1.4E-14	1.0E-14

Table 3.2.2.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA57	MA67
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.1E-16	1.1E-16	1.1E-16	1.1E-16
bcsstk35.RSA	1.8E-16	3.1E-16	3.6E-16	4.0E-16
bcsstk37.RSA	1.8E-15	1.2E-15	1.1E-15	1.2E-15
bcsstk39.RSA	4.9E-16	2.5E-16	2.4E-16	2.9E-16
BLOCKQP1.rsa	1.2E-12	1.8E-13	1.2E-12	4.2E-12
BLOWEYA.rsa	2.7E-18	7.7E-18	1.7E-17	2.3E-17
bmw3_2.rsa	7.6E-16	3.8E-16	2.7E-16	2.2E-16
BOYD1.RSA	9.0E-10	3.0E-10	1.3E-09	1.1E-09
BOYD2.RSA	6.8E-07	6.8E-07	7.0E-07	7.0E-07
BRAINPC2.rsa	8.7E-12	1.3E-07	8.3E-12	9.9E-12
BRATU3D.RSA	–	–	–	–
c-55.RSA	6.7E-11	2.9E-10	6.2E-11	7.6E-11
c-58.RSA	2.3E-10	3.9E-10	2.5E-10	6.3E-10
c-59.RSA	3.1E-09	1.3E-09	1.8E-09	8.5E-10
c-62.RSA	5.1E-10	1.1E-09	5.2E-10	2.3E-10
c-63.RSA	2.8E-10	5.7E-10	3.8E-10	6.7E-10
c-68.RSA	7.4E-14	3.3E-13	5.7E-14	1.0E-12
c-69.RSA	6.2E-11	8.2E-11	4.9E-11	9.8E-11
c-70.RSA	1.0E-10	7.2E-11	1.3E-10	4.2E-11
c-71.RSA	8.0E-10	1.5E-09	3.8E-10	4.0E-09
c-72.RSA	3.7E-11	1.0E-09	4.7E-11	5.8E-11
CONT-201.RSA	–	–	–	8.6E-14
CONT-300.RSA	–	–	–	1.1E-13
copter2.rsa	5.2E-11	6.0E-11	3.4E-11	6.2E-11
crystk02.RSA	4.8E-15	3.5E-15	2.3E-15	3.2E-15
crystk03.RSA	6.1E-15	4.6E-15	2.9E-15	4.1E-15
DARCY003.rsa	9.4E-15	3.1E-15	1.8E-15	3.5E-15
dawson5.rsa	1.9E-12	1.6E-11	1.2E-11	1.1E-11
DIXMAANL.rsa	2.9E-15	3.5E-14	3.6E-14	1.3E-15
DTOC.mat	3.2E-13	3.9E-16	–	2.3E-13
D_PRETOK.rsa	2.5E-14	9.9E-15	2.1E-07	1.2E-13
HELM2D03.rsa	4.9E-11	4.8E-12	4.3E-12	2.1E-12
HELM3D01.rsa	4.4E-11	1.8E-11	3.5E-12	9.2E-12
K1_SAN.rsa	1.5E-13	1.2E-14	4.7E-15	1.5E-14
LINVERSE.rsa	1.8E-16	1.8E-16	7.1E-16	8.6E-16
mario001.rsa	5.8E-15	2.1E-15	1.1E-15	1.8E-15
mario002.rsa	9.4E-15	3.1E-15	1.8E-15	3.5E-15
NCVXBQP1.rsa	1.6E-12	3.3E-13	1.2E-13	1.6E-13
NCVXQP1.mat	1.3E-15	–	6.0E-16	7.8E-16
NCVXQP3.rsa	4.1E-09	–	3.7E-09	–
NCVXQP5.rsa	5.6E-10	2.0E-09	2.0E-09	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1.1E-16	1.8E-14	1.3E-16	1.3E-12
olesnik0.rsa	–	9.3E-15	5.3E-15	1.4E-14
qa8fk.RSA	6.0E-14	3.5E-14	1.7E-14	9.5E-14

Table 3.2.2.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA57	MA67
SIT100.rsa	2.3E-15	1.2E-15	1.9E-15	1.2E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	4.5E-14	3.0E-14	2.8E-13	1.7E-14
stokes128.mat	2.6E-12	1.9E-13	3.5E-13	5.1E-13
stokes64.mat	5.7E-13	2.3E-13	1.6E-13	2.1E-13
stokes64s.mat	1.2E-14	1.0E-14	9.2E-15	1.2E-14
tuma1.mat	4.6E-15	1.5E-15	1.3E-14	3.1E-14
tuma2.mat	6.1E-15	3.0E-15	1.0E-14	2.6E-14
TURON_M.rsa	7.8E-14	7.5E-15	–	3.7E-14
vibrobox.RSA	6.1E-16	2.9E-16	3.3E-16	4.9E-16

Table 3.2.2.13: Norm of scaled residuals following a single refinement

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	6.4E-17	1.3E-16	5.8E-17	1.2E-16
A2NNSNSL.rsa	7.8E-17	1.4E-16	3.9E-17	4.8E-17
A5ESINDL.rsa	7.3E-17	7.0E-17	6.2E-17	1.1E-16
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.2E-17	1.2E-17	1.3E-17	1.2E-17
bcsstk35.RSA	1.4E-16	2.8E-16	7.6E-16	1.9E-16
bcsstk37.RSA	9.5E-16	9.2E-16	9.9E-16	9.4E-16
bcsstk39.RSA	2.0E-16	2.0E-16	1.9E-16	2.0E-16
BLOCKQP1.rsa	2.4E-15	4.8E-14	4.9E-14	7.1E-14
BLOWEYA.rsa	3.5E-18	5.1E-18	1.3E-17	2.4E-17
bmw3_2.rsa	3.0E-16	2.2E-16	2.7E-16	2.0E-16
BOYD1.RSA	4.9E-14	5.0E-14	3.7E-14	2.4E-14
BOYD2.RSA	2.2E-15	3.5E-15	3.9E-15	4.7E-15
BRAINPC2.rsa	1.4E-15	2.1E-13	1.3E-15	1.6E-15
BRATU3D.RSA	–	–	–	–
c-55.RSA	1.1E-17	3.4E-17	1.2E-17	1.1E-17
c-58.RSA	3.5E-16	9.8E-16	2.2E-16	5.3E-16
c-59.RSA	4.9E-15	4.1E-15	3.8E-15	5.1E-15
c-62.RSA	4.1E-15	1.4E-15	1.0E-15	2.2E-15
c-63.RSA	1.2E-16	5.4E-16	8.5E-17	5.1E-16
c-68.RSA	3.9E-17	3.9E-17	3.3E-17	3.3E-17
c-69.RSA	1.3E-16	2.5E-16	9.8E-17	2.0E-16
c-70.RSA	1.3E-16	7.1E-17	5.5E-17	1.3E-17
c-71.RSA	4.7E-15	1.5E-14	1.6E-16	3.7E-14
c-72.RSA	3.2E-17	1.7E-14	4.9E-17	3.6E-16
CONT-201.RSA	–	–	–	1.3E-15
CONT-300.RSA	–	–	–	1.9E-15
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.5E-15	1.5E-15	1.4E-15	1.5E-15
crystk03.RSA	1.9E-15	1.7E-15	1.8E-15	1.8E-15
DARCY003.rsa	1.0E-16	9.9E-17	9.3E-17	9.7E-17

Table 3.2.2.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA57	MA67
dawson5.rsa	2.3E-16	2.2E-16	2.3E-16	2.2E-16
DIXMAANL.rsa	9.8E-17	1.0E-16	1.0E-16	9.6E-17
DTOC.mat	2.8E-14	1.7E-15	–	2.3E-13
D_PRETOK.rsa	1.2E-16	1.1E-16	1.6E-09	1.2E-16
HELM2D03.rsa	3.6E-15	3.6E-15	3.6E-15	3.6E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.3E-16	1.1E-16	1.1E-16	1.1E-16
LINVERSE.rsa	9.7E-17	9.5E-17	9.7E-17	9.5E-17
mario001.rsa	9.5E-17	9.3E-17	8.6E-17	9.5E-17
mario002.rsa	1.0E-16	9.9E-17	9.3E-17	9.7E-17
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.1E-16	–	1.0E-16	9.1E-17
NCVXQP3.rsa	5.2E-16	–	6.6E-16	–
NCVXQP5.rsa	1.4E-16	1.7E-16	1.4E-16	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	8.3E-25	3.4E-24	4.5E-24	2.4E-21
olesnik0.rsa	–	1.0E-16	9.2E-17	9.7E-17
qa8fk.RSA	1.7E-14	7.6E-15	5.4E-15	1.1E-13
SIT100.rsa	2.7E-16	2.0E-16	2.1E-16	2.1E-16
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
stokes128.mat	5.0E-13	1.5E-13	2.0E-13	3.2E-13
stokes64.mat	8.6E-13	6.1E-13	7.3E-14	1.1E-13
stokes64s.mat	1.0E-14	1.3E-14	8.4E-15	1.2E-14
tuma1.mat	7.9E-17	7.7E-17	7.0E-17	7.3E-17
tuma2.mat	7.9E-17	7.5E-17	7.1E-17	7.3E-17
TURON_M.rsa	1.4E-16	3.1E-16	–	1.8E-16
vibrobox.RSA	1.6E-16	1.2E-16	1.3E-16	1.2E-16

3.2.3 Default runs on scaled matrices

Here are the results obtained with the (solver-dependent) default threshold pivoting parameter after the original matrix has been scaled by MC30.

Table 3.2.3.1: Return code

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	0	0	-99	6
AUG2DC.mat	0	0	-99	6
AUG3D.mat	0	0	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0

Table 3.2.3.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	-99	0	0	-99
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	0	-99	0	0
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	-99
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	-99
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	-99
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	-99
c-72.RSA	0	0	0	0
CONT-201.RSA	0	-99	0	0
CONT-300.RSA	0	-99	0	0
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	0	-99	6
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	0	0	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	-99	0	0
NCVXQP3.rsa	0	-99	0	-99
NCVXQP5.rsa	0	-99	0	-99
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-2	-2	-99
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0

Table 3.2.3.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
vibrobox.RSA	0	0	0	0

Table 3.2.3.2: Total time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	24.026	57.804	11.540	98.120
A2NNSNSL.rsa	27.275	49.536	12.397	90.564
A5ESINDL.rsa	356.945	19.621	5.035	111.977
AUG2D.mat	197.588	0.142	–	0.103
AUG2DC.mat	260.067	0.176	–	0.111
AUG3D.mat	916.460	0.298	1036.692	0.087
AUG3DCQP.mat	1.668	1.799	1.294	3.314
bcsstk35.RSA	3.576	2.371	2.422	3.393
bcsstk37.RSA	38.646	10.411	13.700	34.128
bcsstk39.RSA	12.526	7.585	6.504	13.330
BLOCKQP1.rsa	88.125	147.145	27.994	32.038
BLOWEYA.rsa	2.763	1.630	1.748	4.258
bmw3_2.rsa	1087.337	438.597	263.244	–
BOYD1.RSA	710.034	647.993	176.368	485.626
BOYD2.RSA	–	2318.110	1395.565	–
BRAINPC2.rsa	2.220	7.937	1.621	11.430
BRATU3D.RSA	226.561	–	155.162	436.458
c-55.RSA	354.956	75.704	230.052	229.883
c-58.RSA	560.930	54.916	188.430	–
c-59.RSA	213.513	67.180	328.134	191.034
c-62.RSA	1861.014	575.240	1372.739	–
c-63.RSA	192.382	32.475	118.837	174.919
c-68.RSA	334.809	109.039	347.020	–
c-69.RSA	329.714	39.450	145.266	251.118
c-70.RSA	471.976	111.631	514.132	366.015
c-71.RSA	3173.804	1076.178	3332.795	–
c-72.RSA	556.494	79.279	251.214	414.647
CONT-201.RSA	26.716	–	19.156	7.738
CONT-300.RSA	154.603	–	80.726	24.555
copter2.rsa	109.139	89.929	31.821	73.307
crystk02.RSA	19.750	17.290	12.025	17.779
crystk03.RSA	103.206	45.413	24.715	50.725
DARCY003.rsa	15.914	14.700	7.432	29.903
dawson5.rsa	7.204	6.874	4.644	20.494
DIXMAANL.rsa	0.370	0.606	0.486	1.050
DTOC.mat	–	0.229	–	0.528
D_PRETOK.rsa	717.865	211.407	62.392	515.648
HELM2D03.rsa	87.888	72.246	39.054	70.971
HELM3D01.rsa	49.065	40.216	20.197	41.784
K1_SAN.rsa	37.476	11.484	4.610	17.324
LINVERSE.rsa	0.057	0.077	0.061	0.183
mario001.rsa	0.682	0.833	0.446	1.677

Table 3.2.3.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
mario002.rsa	15.933	14.680	7.420	29.854
NCVXBQP1.rsa	32.550	26.372	9.229	22.895
NCVXQP1.mat	255.525	—	101.909	309.827
NCVXQP3.rsa	—	—	1982.227	—
NCVXQP5.rsa	1968.496	—	421.717	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	5.528	169.448	1.023	1.902
olesnik0.rsa	45.304	17.716	6.909	55.392
qa8fk.RSA	650.865	282.617	180.631	473.384
SIT100.rsa	5.989	3.651	4.262	8.586
SPARSINE.rsa	—	—	—	—
SPMSRTL5.rsa	0.149	0.184	0.170	0.232
stokes128.mat	3.252	3.179	1.849	7.076
stokes64.mat	0.459	0.569	0.334	1.880
stokes64s.mat	0.476	0.570	0.342	1.637
tuma1.mat	0.823	0.676	0.423	1.956
tuma2.mat	0.301	0.293	0.168	0.529
TURON_M.rsa	404.148	206.281	46.074	357.877
vibrobox.RSA	85.950	11.598	15.917	84.049

Table 3.2.3.3: Analyse time (CPU seconds)

Name	MA27	MA47	MA57
A0NSDSL.rsa	22.607	57.423	10.209
A2NNSNSL.rsa	24.068	49.183	11.158
A5ESINDL.rsa	6.427	19.278	4.278
AUG2D.mat	0.078	0.107	—
AUG2DC.mat	0.082	0.139	—
AUG3D.mat	0.114	0.268	0.075
AUG3DCQP.mat	0.165	0.341	0.121
bcsstk35.RSA	0.320	0.403	0.327
bcsstk37.RSA	0.262	0.344	0.266
bcsstk39.RSA	0.500	0.626	0.565
BLOCKQP1.rsa	87.692	146.835	27.689
BLOWEYA.rsa	2.679	1.550	1.642
bmw3.2.rsa	3.048	3.912	2.764
BOYD1.RSA	698.446	647.598	107.974
BOYD2.RSA	—	2316.672	687.504
BRAINPC2.rsa	0.958	7.090	1.089
BRATU3D.RSA	0.515	—	0.195
c-55.RSA	1.759	1.548	0.389
c-58.RSA	3.279	2.686	0.662
c-59.RSA	2.074	1.775	0.435
c-62.RSA	4.343	3.275	0.694
c-63.RSA	1.092	1.048	0.364
c-68.RSA	5.822	4.292	0.689
c-69.RSA	1.866	1.679	0.580

Table 3.2.3.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA57
c-70.RSA	1.971	1.840	0.613
c-71.RSA	7.536	5.945	1.123
c-72.RSA	2.007	2.027	0.727
CONT-201.RSA	0.460	–	0.360
CONT-300.RSA	1.125	–	0.897
copter2.rsa	1.325	1.919	0.682
crystk02.RSA	0.234	0.339	0.199
crystk03.RSA	0.495	0.661	0.410
DARCY003.rsa	2.489	7.907	2.616
dawson5.rsa	0.675	1.017	0.452
DIXMAANL.rsa	0.164	0.411	0.226
DTOC.mat	–	0.197	–
D_PRETOK.rsa	1.018	2.957	1.001
HELM2D03.rsa	3.432	5.679	3.183
HELM3D01.rsa	0.826	1.350	0.435
K1_SAN.rsa	0.327	1.054	0.327
LINVERSE.rsa	0.023	0.045	0.028
mario001.rsa	0.149	0.465	0.145
mario002.rsa	2.497	7.903	2.607
NCVXBQP1.rsa	0.535	1.002	0.460
NCVXQP1.mat	0.713	–	0.141
NCVXQP3.rsa	–	–	2.056
NCVXQP5.rsa	7.188	–	1.166
NCVXQP7.rsa	–	–	–
NCVXQP9.mat	0.078	3.148	0.061
olesnik0.rsa	0.497	1.427	0.445
qa8fk.RSA	2.553	3.498	1.042
SIT100.rsa	0.046	0.124	0.043
SPARSINE.rsa	–	–	–
SPMSRTLS.rsa	0.062	0.103	0.078
stokes128.mat	0.262	0.952	0.244
stokes64.mat	0.061	0.199	0.051
stokes64s.mat	0.061	0.199	0.051
tuma1.mat	0.072	0.141	0.067
tuma2.mat	0.041	0.080	0.038
TURON_M.rsa	1.142	3.382	1.073
vibrobox.RSA	0.319	0.432	0.181

Table 3.2.3.4: Factorize time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.379	0.316	1.270	98.055
A2NNSNSL.rsa	3.163	0.291	1.193	90.499
A5ESINDL.rsa	350.328	0.302	0.726	111.922
AUG2D.mat	197.375	0.029	–	0.097
AUG2DC.mat	259.839	0.031	–	0.103
AUG3D.mat	915.992	0.025	1036.096	0.082

Table 3.2.3.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
AUG3DCQP.mat	1.472	1.409	1.136	3.267
bcsstk35.RSA	3.161	1.879	1.988	3.277
bcsstk37.RSA	38.191	9.938	13.282	33.913
bcsstk39.RSA	11.811	6.746	5.691	12.987
BLOCKQP1.rsa	0.408	0.254	0.276	32.005
BLOWEYA.rsa	0.077	0.067	0.096	4.244
bmw3_2.rsa	1082.280	432.969	258.781	–
BOYD1.RSA	11.451	0.307	67.911	485.548
BOYD2.RSA	–	1.042	706.893	–
BRAINPC2.rsa	1.222	0.829	0.514	11.412
BRATU3D.RSA	225.653	–	154.569	436.027
c-55.RSA	352.837	73.940	229.408	229.708
c-58.RSA	557.163	52.085	187.563	–
c-59.RSA	211.027	65.226	327.380	190.804
c-62.RSA	1855.342	571.168	1370.948	–
c-63.RSA	191.026	31.288	118.239	174.717
c-68.RSA	328.577	104.494	346.015	–
c-69.RSA	327.471	37.582	144.411	250.804
c-70.RSA	469.534	109.528	513.139	365.652
c-71.RSA	3164.622	1069.359	3330.452	–
c-72.RSA	554.004	77.011	250.155	414.264
CONT-201.RSA	25.968	–	18.505	7.563
CONT-300.RSA	152.663	–	79.049	24.101
copter2.rsa	107.448	87.521	30.766	72.835
crystk02.RSA	19.389	16.798	11.678	17.602
crystk03.RSA	102.398	44.433	24.022	50.359
DARCY003.rsa	12.965	6.365	4.437	29.110
dawson5.rsa	6.391	5.691	4.046	20.294
DIXMAANL.rsa	0.183	0.152	0.230	1.006
DTOC.mat	–	0.026	–	0.516
D_PRETOK.rsa	715.421	207.335	60.573	513.704
HELM2D03.rsa	83.519	65.425	34.918	69.608
HELM3D01.rsa	48.062	38.638	19.572	41.521
K1_SAN.rsa	36.869	10.209	4.128	17.052
LINVERSE.rsa	0.029	0.025	0.028	0.178
mario001.rsa	0.499	0.335	0.275	1.632
mario002.rsa	12.982	6.351	4.436	29.073
NCVXBQP1.rsa	31.866	25.193	8.640	22.714
NCVXQP1.mat	254.528	–	101.537	309.659
NCVXQP3.rsa	–	–	1978.016	–
NCVXQP5.rsa	1959.659	–	419.615	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	5.410	166.252	0.944	1.880
olesnik0.rsa	44.435	15.996	6.251	54.871
qa8fk.RSA	647.207	277.975	178.615	472.036
SIT100.rsa	5.888	3.484	4.175	8.515
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.080	0.063	0.077	0.219

Table 3.2.3.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
stokes128.mat	2.889	2.121	1.511	6.933
stokes64.mat	0.380	0.351	0.268	1.851
stokes64s.mat	0.396	0.353	0.271	1.607
tuma1.mat	0.725	0.511	0.337	1.919
tuma2.mat	0.251	0.202	0.122	0.516
TURON_M.rsa	401.814	201.758	44.294	355.747
vibrobox.RSA	85.464	11.091	15.648	83.842

Table 3.2.3.5: Solution time given factors (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.040	0.064	0.061	0.065
A2NNSNSL.rsa	0.044	0.062	0.047	0.065
A5ESINDL.rsa	0.189	0.041	0.031	0.055
AUG2D.mat	0.136	0.006	–	0.007
AUG2DC.mat	0.146	0.006	–	0.008
AUG3D.mat	0.354	0.004	0.520	0.005
AUG3DCQP.mat	0.031	0.049	0.037	0.048
bcsstk35.RSA	0.095	0.089	0.107	0.115
bcsstk37.RSA	0.193	0.130	0.151	0.215
bcsstk39.RSA	0.216	0.214	0.248	0.344
BLOCKQP1.rsa	0.025	0.056	0.028	0.033
BLOWEYA.rsa	0.006	0.013	0.011	0.015
bmw3_2.rsa	2.010	1.716	1.699	2.342
BOYD1.RSA	0.137	0.087	0.483	0.078
BOYD2.RSA	–	0.396	1.167	–
BRAINPC2.rsa	0.040	0.019	0.018	0.018
BRATU3D.RSA	0.392	–	0.397	0.431
c-55.RSA	0.360	0.217	0.255	0.175
c-58.RSA	0.487	0.144	0.205	–
c-59.RSA	0.412	0.179	0.319	0.230
c-62.RSA	1.240	0.796	1.097	–
c-63.RSA	0.264	0.140	0.233	0.202
c-68.RSA	0.410	0.252	0.315	–
c-69.RSA	0.377	0.189	0.275	0.314
c-70.RSA	0.471	0.264	0.381	0.362
c-71.RSA	1.638	0.874	1.220	–
c-72.RSA	0.483	0.240	0.332	0.383
CONT-201.RSA	0.288	–	0.291	0.175
CONT-300.RSA	0.815	–	0.780	0.454
copter2.rsa	0.366	0.489	0.372	0.472
crystk02.RSA	0.127	0.153	0.148	0.177
crystk03.RSA	0.313	0.319	0.283	0.366
DARCY003.rsa	0.460	0.427	0.380	0.793
dawson5.rsa	0.138	0.166	0.145	0.200
DIXMAANL.rsa	0.022	0.043	0.029	0.044
DTOC.mat	–	0.006	–	0.012

Table 3.2.3.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
D_PRETOK.rsa	1.426	1.116	0.818	1.944
HELM2D03.rsa	0.937	1.142	0.953	1.363
HELM3D01.rsa	0.178	0.228	0.190	0.263
K1_SAN.rsa	0.280	0.221	0.154	0.272
LINVERSE.rsa	0.004	0.007	0.004	0.006
mario001.rsa	0.034	0.033	0.025	0.045
mario002.rsa	0.455	0.427	0.377	0.781
NCVXBQP1.rsa	0.148	0.176	0.130	0.181
NCVXQP1.mat	0.283	–	0.231	0.168
NCVXQP3.rsa	8.160	–	2.151	–
NCVXQP5.rsa	1.649	–	0.936	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.040	0.049	0.019	0.022
olesnik0.rsa	0.372	0.294	0.213	0.521
qa8fk.RSA	1.105	1.145	0.974	1.349
SIT100.rsa	0.055	0.043	0.044	0.071
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.007	0.018	0.015	0.014
stokes128.mat	0.102	0.106	0.094	0.143
stokes64.mat	0.019	0.019	0.015	0.028
stokes64s.mat	0.020	0.018	0.020	0.029
tuma1.mat	0.025	0.024	0.019	0.037
tuma2.mat	0.009	0.011	0.008	0.013
TURON_M.rsa	1.192	1.141	0.708	2.130
vibrobox.RSA	0.167	0.074	0.088	0.207

Table 3.2.3.6: Minimum memory required (Mbytes)

Name	MA57	MA67
A0NSDSIL.rsa	1.5E+01	6.0E+01
A2NNSNSL.rsa	1.5E+01	5.7E+01
A5ESINDL.rsa	1.1E+01	6.8E+01
AUG2D.mat	–	4.6E+00
AUG2DC.mat	–	4.8E+00
AUG3D.mat	2.6E+03	4.0E+00
AUG3DCQP.mat	1.9E+01	2.7E+01
bcsstk35.RSA	4.7E+01	5.0E+01
bcsstk37.RSA	6.1E+01	1.5E+02
bcsstk39.RSA	8.9E+01	1.2E+02
BLOCKQP1.rsa	1.6E+01	2.5E+01
BLOWEYA.rsa	5.1E+00	8.1E+00
bmw3_2.rsa	9.1E+02	1.3E+03
BOYD1.RSA	2.5E+02	5.6E+01
BOYD2.RSA	1.5E+03	–
BRAINPC2.rsa	7.3E+00	9.1E+00
BRATU3D.RSA	2.9E+02	8.2E+02
c-55.RSA	3.1E+02	2.8E+02

Table 3.2.3.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA67
c-58.RSA	3.0E+02	–
c-59.RSA	2.9E+02	2.4E+02
c-62.RSA	9.5E+02	–
c-63.RSA	2.2E+02	2.5E+02
c-68.RSA	3.5E+02	–
c-69.RSA	2.8E+02	4.3E+02
c-70.RSA	4.9E+02	5.5E+02
c-71.RSA	1.6E+03	–
c-72.RSA	3.8E+02	5.8E+02
CONT-201.RSA	1.1E+02	6.6E+01
CONT-300.RSA	3.1E+02	1.7E+02
copter2.rsa	1.6E+02	2.3E+02
crystk02.RSA	8.5E+01	1.0E+02
crystk03.RSA	1.5E+02	2.0E+02
DARCY003.rsa	1.1E+02	1.9E+02
dawson5.rsa	6.3E+01	9.4E+01
DIXMAANL.rsa	1.2E+01	1.6E+01
DTOC.mat	–	2.5E+02
D_PRETOK.rsa	3.4E+02	9.7E+02
HELM2D03.rsa	3.3E+02	4.0E+02
HELM3D01.rsa	1.2E+02	1.6E+02
K1_SAN.rsa	5.7E+01	1.1E+02
LINVERSE.rsa	2.7E+00	4.6E+00
mario001.rsa	9.6E+00	1.5E+01
mario002.rsa	1.1E+02	1.9E+02
NCVXBQP1.rsa	7.5E+01	1.2E+02
NCVXQP1.mat	2.7E+02	1.9E+02
NCVXQP3.rsa	2.1E+03	–
NCVXQP5.rsa	8.2E+02	–
NCVXQP7.rsa	–	–
NCVXQP9.mat	1.2E+01	1.1E+01
olesnik0.rsa	8.1E+01	2.4E+02
qa8fk.RSA	4.7E+02	8.1E+02
SIT100.rsa	2.5E+01	5.7E+01
SPARSINE.rsa	–	–
SPMSRTLS.rsa	6.0E+00	8.4E+00
stokes128.mat	3.4E+01	5.7E+01
stokes64.mat	7.6E+00	1.2E+01
stokes64s.mat	7.6E+00	1.3E+01
tuma1.mat	8.8E+00	2.2E+01
tuma2.mat	4.1E+00	7.0E+00
TURON_M.rsa	2.8E+02	7.9E+02
vibrobox.RSA	8.1E+01	2.4E+02

Table 3.2.3.7: Actual memory used (Mbytes)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.6E+01	1.3E+01	1.5E+01	1.1E+03

Table 3.2.3.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA57	MA67
A2NNSNSL.rsa	1.6E+01	1.3E+01	1.5E+01	1.0E+03
A5ESINDL.rsa	1.0E+02	8.4E+00	1.0E+01	1.3E+03
AUG2D.mat	9.9E+02	2.4E+00	–	5.4E+00
AUG2DC.mat	8.1E+02	2.5E+00	–	5.6E+00
AUG3D.mat	1.5E+03	2.1E+00	3.1E+03	4.7E+00
AUG3DCQP.mat	1.4E+01	2.1E+01	2.0E+01	4.0E+01
bcsstk35.RSA	4.8E+01	4.8E+01	5.4E+01	9.9E+01
bcsstk37.RSA	9.5E+01	7.2E+01	6.9E+01	2.9E+02
bcsstk39.RSA	1.0E+02	9.9E+01	1.0E+02	2.4E+02
BLOCKQP1.rsa	2.6E+01	1.8E+01	1.9E+01	4.3E+01
BLOWEYA.rsa	4.1E+00	4.7E+00	5.7E+00	9.3E+00
bmw3.2.rsa	1.1E+03	1.0E+03	1.0E+03	2.2E+03
BOYD1.RSA	8.3E+01	3.6E+01	2.6E+02	1.2E+02
BOYD2.RSA	–	5.7E+01	1.5E+03	–
BRAINPC2.rsa	2.4E+01	7.7E+00	8.4E+00	8.4E+00
BRATU3D.RSA	2.8E+02	–	3.0E+02	1.1E+03
c-55.RSA	2.6E+02	2.2E+02	3.1E+02	2.5E+03
c-58.RSA	4.2E+02	1.7E+02	3.2E+02	–
c-59.RSA	1.9E+02	2.2E+02	2.9E+02	7.0E+02
c-62.RSA	9.1E+02	6.7E+02	1.0E+03	–
c-63.RSA	1.6E+02	1.2E+02	2.3E+02	6.5E+02
c-68.RSA	2.3E+02	3.1E+02	3.4E+02	–
c-69.RSA	2.8E+02	1.4E+02	2.9E+02	7.4E+02
c-70.RSA	3.7E+02	2.7E+02	5.0E+02	3.1E+03
c-71.RSA	1.2E+03	1.3E+03	1.6E+03	–
c-72.RSA	3.6E+02	2.1E+02	3.9E+02	1.7E+03
CONT-201.RSA	1.3E+02	–	1.2E+02	1.2E+02
CONT-300.RSA	3.6E+02	–	3.3E+02	2.6E+02
copter2.rsa	1.9E+02	2.7E+02	1.8E+02	5.0E+02
crystk02.RSA	7.2E+01	9.9E+01	9.7E+01	1.9E+02
crystk03.RSA	1.7E+02	1.9E+02	1.7E+02	3.4E+02
DARCY003.rsa	1.4E+02	1.2E+02	1.1E+02	2.9E+02
dawson5.rsa	6.5E+01	7.6E+01	7.0E+01	1.6E+02
DIXMAANL.rsa	9.5E+00	1.1E+01	1.3E+01	2.0E+01
DTOC.mat	–	2.1E+00	–	2.3E+01
D_PRETOK.rsa	6.6E+02	5.9E+02	3.6E+02	1.9E+03
HELM2D03.rsa	3.3E+02	4.1E+02	3.5E+02	5.3E+02
HELM3D01.rsa	9.6E+01	1.5E+02	1.3E+02	2.8E+02
K1_SAN.rsa	1.3E+02	8.6E+01	6.4E+01	1.8E+02
LINVERSE.rsa	2.2E+00	3.0E+00	2.9E+00	8.0E+00
mario001.rsa	1.2E+01	9.8E+00	1.0E+01	2.9E+01
mario002.rsa	1.4E+02	1.2E+02	1.1E+02	2.9E+02
NCVXBQP1.rsa	6.9E+01	1.2E+02	7.8E+01	1.4E+02
NCVXQP1.mat	3.0E+02	–	2.8E+02	8.0E+02
NCVXQP3.rsa	3.3E+03	–	2.2E+03	–
NCVXQP5.rsa	8.1E+02	–	8.5E+02	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	2.0E+01	2.7E+01	1.3E+01	1.6E+01

Table 3.2.3.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA57	MA67
olesnik0.rsa	1.6E+02	1.2E+02	9.4E+01	4.6E+02
qa8fk.RSA	5.5E+02	5.5E+02	5.3E+02	1.0E+03
SIT100.rsa	2.6E+01	3.2E+01	2.6E+01	9.4E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	5.1E+00	6.6E+00	6.4E+00	9.2E+00
stokes128.mat	3.8E+01	3.6E+01	3.5E+01	1.2E+02
stokes64.mat	7.9E+00	8.3E+00	8.1E+00	1.5E+01
stokes64s.mat	7.9E+00	8.3E+00	8.1E+00	2.9E+01
tuma1.mat	1.1E+01	1.1E+01	9.1E+00	2.8E+01
tuma2.mat	5.1E+00	5.9E+00	4.3E+00	9.5E+00
TURON_M.rsa	5.3E+02	5.2E+02	2.8E+02	1.0E+03
vibrobox.RSA	1.3E+02	6.3E+01	8.5E+01	4.8E+02

Table 3.2.3.8: Number of integers used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	407593	165036	702448	487158
A2NNSNSL.rsa	512009	165269	661064	469874
A5ESINDL.rsa	3412358	135013	488425	332499
AUG2D.mat	236054	86439	—	86439
AUG2DC.mat	255342	90003	—	90003
AUG3D.mat	305974	64155	319170	64155
AUG3DCQP.mat	204287	142864	237508	242710
bcsstk35.RSA	234143	215908	227844	272571
bcsstk37.RSA	230670	202913	218593	294749
bcsstk39.RSA	411218	385098	395732	560061
BLOCKQP1.rsa	380004	190021	399890	400017
BLOWEYA.rsa	130000	108010	140001	143894
bmw3.2.rsa	2205510	2002081	2119630	—
BOYD1.RSA	3094164	242571	483501	848363
BOYD2.RSA	—	890092	2140797	—
BRAINPC2.rsa	305575	96501	245916	189045
BRATU3D.RSA	410133	—	397378	1270077
c-55.RSA	424773	217580	380202	800240
c-58.RSA	558482	271255	556711	—
c-59.RSA	484946	241953	433119	864366
c-62.RSA	708790	311362	550342	—
c-63.RSA	409860	211728	369354	861437
c-68.RSA	846528	415050	642100	—
c-69.RSA	544198	294215	501030	1089809
c-70.RSA	598385	311214	534062	1083002
c-71.RSA	1197879	528657	906986	—
c-72.RSA	745361	367808	645995	1089066
CONT-201.RSA	683543	—	644769	787614
CONT-300.RSA	1593542	—	1473774	1787955
copter2.rsa	808852	515679	837915	984244
crystk02.RSA	181456	146351	173257	215403

Table 3.2.3.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA57	MA67
crystk03.RSA	329942	271630	317983	402408
DARCY003.rsa	2096118	2304499	1937789	3017793
dawson5.rsa	549475	346585	562121	690240
DIXMAANL.rsa	349614	130002	457012	375611
DTOC.mat	–	84974	–	148665
D_PRETOK.rsa	1560675	1571045	1373448	2213737
HELM2D03.rsa	3623312	2135055	3744078	3758365
HELM3D01.rsa	467226	262027	480597	540834
K1_SAN.rsa	531704	533125	455313	706382
LINVERSE.rsa	41998	22005	42005	64520
mario001.rsa	201924	221592	186996	284618
mario002.rsa	2096118	2304499	1937789	3017793
NCVXBQP1.rsa	498603	285053	516654	558716
NCVXQP1.mat	285723	–	259145	849516
NCVXQP3.rsa	–	–	2195023	–
NCVXQP5.rsa	1301098	–	1243266	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	105227	672892	99695	135975
olesnik0.rsa	693416	718033	596772	1032649
qa8fk.RSA	1539848	886262	1861292	1499241
SIT100.rsa	85945	59878	88922	125116
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	118698	54991	129868	124342
stokes128.mat	317923	597377	306893	587263
stokes64.mat	78564	143908	76565	149581
stokes64s.mat	79645	144256	76575	168117
tuma1.mat	130442	77362	123510	148620
tuma2.mat	72276	42233	67681	81260
TURON_M.rsa	1584697	1635618	1368028	2398614
vibrobox.RSA	172269	110931	205562	274633

Table 3.2.3.9: Number of reals used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	800441	677777	546626	1179105
A2NNSNSL.rsa	922021	663122	512916	1119174
A5ESINDL.rsa	5331849	370085	376261	1337191
AUG2D.mat	6510270	57624	–	57624
AUG2DC.mat	7693508	60000	–	60000
AUG3D.mat	18854488	46656	20253212	46656
AUG3DCQP.mat	1003581	1172881	958088	1238001
bcsstk35.RSA	3310073	2927485	2844652	3354561
bcsstk37.RSA	7937539	4820918	4725782	7652718
bcsstk39.RSA	8133402	7286742	6688229	9390067
BLOCKQP1.rsa	380081	880042	380113	380079
BLOWEYA.rsa	140006	120008	140008	109174
bmw3_2.rsa	96450356	69043125	68074811	–
BOYD1.RSA	3017902	839309	26852345	677099

Table 3.2.3.9: Number of reals used for factors (continued)

Name	MA27	MA47	MA57	MA67
BOYD2.RSA	–	2691532	61603776	–
BRAINPC2.rsa	1194181	272869	352390	243591
BRATU3D.RSA	22207883	–	18209670	19772597
c-55.RSA	18491694	9114364	12830695	8406782
c-58.RSA	24042983	5861773	10346733	–
c-59.RSA	13211689	7542464	11389619	7993983
c-62.RSA	53621535	25610679	43455765	–
c-63.RSA	12112047	5274465	9407245	8005662
c-68.RSA	14905961	9928660	12491913	–
c-69.RSA	18181130	6644221	12893938	13052853
c-70.RSA	23022170	10716300	19631984	16170151
c-71.RSA	81439865	43138856	65409241	–
c-72.RSA	22864608	8850198	15773597	17590582
CONT-201.RSA	13259324	–	10433562	4609179
CONT-300.RSA	38962587	–	29257997	12665245
copter2.rsa	17475695	19346524	14143168	17584009
crystk02.RSA	6284037	6352770	6098264	7155635
crystk03.RSA	15118748	13702950	11904222	15317806
DARCY003.rsa	12014989	7942200	6966444	12863310
dawson5.rsa	5258788	5566249	4627806	6454131
DIXMAANL.rsa	350900	510039	340501	392306
DTOC.mat	–	54980	–	118672
D_PRETOK.rsa	70026094	44127161	30099198	77541412
HELM2D03.rsa	31687653	34710614	28015811	31592325
HELM3D01.rsa	8194076	9031118	7632320	8984090
K1_SAN.rsa	12722979	7314608	4810524	9063002
LINVERSE.rsa	56608	78025	54491	81308
mario001.rsa	856828	577106	530558	818109
mario002.rsa	12014989	7942200	6966444	12863310
NCVXBQP1.rsa	5737049	6018036	4145233	5383864
NCVXQP1.mat	14184696	–	12208080	6650818
NCVXQP3.rsa	–	–	105202425	–
NCVXQP5.rsa	63563142	–	42669203	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1695377	1031734	606605	534970
olesnik0.rsa	16252400	9838483	6694758	18850245
qa8fk.RSA	51388343	46649779	40901710	58263681
SIT100.rsa	2579981	1719519	1793879	2795746
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	130998	194975	130233	151728
stokes128.mat	3391427	2792212	2714396	4118647
stokes64.mat	670417	562687	557892	800886
stokes64s.mat	694608	563237	558038	857122
tuma1.mat	820791	684279	544908	1125069
tuma2.mat	380420	329807	231941	362437
TURON_M.rsa	57139537	43874067	25219746	67124174
vibrobox.RSA	8509460	3148069	3970238	8977376

Table 3.2.3.10: Total number of integers used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	464972	400042	702611	4624513
A2NNSNSL.rsa	435954	392230	661224	4408755
A5ESINDL.rsa	280012	290008	488498	4613948
AUG2D.mat	147351	106044	–	540163
AUG2DC.mat	153655	110408	–	562387
AUG3D.mat	145750	89432	296000	465323
AUG3DCQP.mat	205903	210744	239568	930465
bcsstk35.RSA	740239	1480400	770442	1843254
bcsstk37.RSA	583264	1166480	608748	1472526
bcsstk39.RSA	1068081	2136066	1114810	2697340
BLOCKQP1.rsa	620028	680064	420062	2140539
BLOWEYA.rsa	140022	220027	150024	860093
bmw3.2.rsa	5758017	11515992	5985363	–
BOYD1.RSA	746195	1491014	838820	5327874
BOYD2.RSA	–	1822733	2288358	–
BRAINPC2.rsa	138042	193464	246061	976541
BRATU3D.RSA	406367	–	404692	3344656
c-55.RSA	468480	436230	397645	2821449
c-58.RSA	548100	590152	575990	–
c-59.RSA	514229	521818	446768	2373034
c-62.RSA	687191	601074	578074	–
c-63.RSA	422291	478938	376926	2038683
c-68.RSA	910381	630816	658505	–
c-69.RSA	572678	691428	508597	2402825
c-70.RSA	639584	727910	549104	4891460
c-71.RSA	1238837	936192	939068	–
c-72.RSA	728498	791622	654734	3911689
CONT-201.RSA	737107	–	647720	2952146
CONT-300.RSA	1676247	–	1478839	6675664
copter2.rsa	857863	815428	862536	3912580
crystk02.RSA	491313	982548	505244	1150138
crystk03.RSA	887976	1775874	912638	2072236
DARCY003.rsa	2310376	2335370	1939720	10041316
dawson5.rsa	578306	1062314	582864	3258374
DIXMAANL.rsa	350000	359998	457037	1500006
DTOC.mat	–	94977	–	474851
D_PRETOK.rsa	1582490	1770832	1382447	6361531
HELM2D03.rsa	3629422	3134192	3752224	13057600
HELM3D01.rsa	495891	460670	494622	2217553
K1_SAN.rsa	551990	606728	458077	2236029
LINVERSE.rsa	59988	119976	71992	395853
mario001.rsa	223874	229286	187600	985686
mario002.rsa	2310376	2335370	1939720	10041316
NCVXBQP1.rsa	508195	499968	519047	1549847
NCVXQP1.mat	217435	–	270494	2371461
NCVXQP3.rsa	–	–	2231556	–
NCVXQP5.rsa	1236448	–	1270932	–
NCVXQP7.rsa	–	–	–	–

Table 3.2.3.10: Total number of integers used (continued)

Name	MA27	MA47	MA57	MA67
NCVXQP9.mat	88993	674037	100843	369908
olesnik0.rsa	722127	805246	600629	2950222
qa8fk.RSA	1584913	1726706	1892539	9102363
SIT100.rsa	85967	68188	91206	342261
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129987	259942	159976	669884
stokes128.mat	447306	602026	362008	2380770
stokes64.mat	110599	148484	90904	595528
stokes64s.mat	110599	148484	90904	604630
tuma1.mat	142924	152398	124680	527334
tuma2.mat	78235	85870	68310	297580
TURON_M.rsa	1634660	1824690	1377310	6573196
vibrobox.RSA	226089	355156	216881	963970

Table 3.2.3.11: Total number of reals used

Name	MA27	MA47	MA57	MA67
A0NSDSL.rsa	519807	678994	558344	4525797
A2NNSNSL.rsa	463110	662080	524004	4282175
A5ESINDL.rsa	249980	360694	382086	5770505
AUG2D.mat	270709	76832	—	153657
AUG2DC.mat	288181	80000	—	159993
AUG3D.mat	693600	69984	328977068	139553
AUG3DCQP.mat	1243294	2076270	1726160	2581145
bcsstk35.RSA	2969697	3211768	3101265	3824072
bcsstk37.RSA	3174983	5913356	5482247	16425919
bcsstk39.RSA	8094097	8114804	7106639	11010495
BLOCKQP1.rsa	1700035	870300	420242	1200099
BLOWEYA.rsa	130012	180012	140055	330022
bmw3.2.rsa	64274845	97982584	92108578	—
BOYD1.RSA	838786	1491014	28411338	2662498
BOYD2.RSA	—	2585368	182449799	—
BRAINPC2.rsa	158766	272038	357519	386536
BRATU3D.RSA	11015132	—	35462295	100349935
c-55.RSA	8416233	20924225	37743634	32928140
c-58.RSA	7111004	18578005	35808675	—
c-59.RSA	5752783	21889591	34482120	28127523
c-62.RSA	15646102	67387455	116871875	—
c-63.RSA	3404098	12772687	26157865	29601592
c-68.RSA	11870180	28811286	41815566	—
c-69.RSA	3892702	13754621	33865035	51658299
c-70.RSA	5737156	28772864	60108661	65846914
c-71.RSA	36194417	121214041	193868661	—
c-72.RSA	4799099	22676168	45998239	69298876
CONT-201.RSA	4407324	—	12328963	6035555
CONT-300.RSA	11731238	—	35714096	16908043
copter2.rsa	19867719	30649794	18401038	26254657
crystk02.RSA	6517207	10186953	8827118	11319649

Table 3.2.3.11: Total number of reals used (continued)

Name	MA27	MA47	MA57	MA67
crystk03.RSA	16703368	19664285	15713960	22679139
DARCY003.rsa	6652597	8979396	7600284	15147550
dawson5.rsa	5599303	7092148	5754861	8930618
DIXMAANL.rsa	350020	510147	380038	719997
DTOC.mat	–	69972	–	31283236
D_PRETOK.rsa	34869093	60201201	37919486	116370371
HELM2D03.rsa	33319047	42566587	32569973	39185470
HELM3D01.rsa	9972738	17174767	13763904	18387395
K1_SAN.rsa	6647640	9231198	5670058	12075498
LINVERSE.rsa	71987	119976	60021	221909
mario001.rsa	495098	676876	576095	1034599
mario002.rsa	6652597	8979396	7600284	15147550
NCVXBQP1.rsa	6844070	13514153	8071629	13862586
NCVXQP1.mat	4084959	–	32926430	22722580
NCVXQP3.rsa	–	–	264146865	–
NCVXQP5.rsa	42371340	–	101169794	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	171887	1980831	1254738	1042492
olesnik0.rsa	8601487	12782351	8181749	27000853
qa8fk.RSA	58388401	63045819	55505819	94431201
SIT100.rsa	810208	3143046	2922334	6876635
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	159966	259942	130102	379919
stokes128.mat	3083370	3288162	2946251	5247435
stokes64.mat	599167	690910	622493	1028642
stokes64s.mat	599167	691460	622639	1106932
tuma1.mat	697398	1051900	697272	2303181
tuma2.mat	299148	511895	286650	612360
TURON_M.rsa	32364595	59594724	30983766	92984433
vibrobox.RSA	3443649	6997270	9452766	28853407

Table 3.2.3.12: Norm of scaled residuals

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	8.5E-16	5.1E-16	1.2E-15	6.7E-16
A2NNSNSL.rsa	3.6E-15	3.5E-16	4.7E-16	8.0E-16
A5ESINDL.rsa	4.7E-16	1.5E-15	8.6E-16	3.9E-16
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-16	1.3E-16	1.3E-16	1.3E-16
bcsstk35.RSA	4.3E-16	2.2E-16	1.0E-16	3.6E-16
bcsstk37.RSA	4.3E-15	2.4E-15	1.6E-15	2.6E-15
bcsstk39.RSA	5.0E-16	2.7E-16	2.6E-16	3.1E-16
BLOCKQP1.rsa	1.2E-12	1.9E-13	1.2E-12	1.2E-12
BLOWEYA.rsa	1.4E-13	1.5E-13	1.4E-13	1.5E-13
bmw3_2.rsa	6.0E-16	4.7E-16	2.7E-16	3.3E-16
BOYD1.RSA	3.1E-09	2.6E-10	3.7E-09	3.1E-09

Table 3.2.3.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA57	MA67
BOYD2.RSA	–	5.0E-07	4.6E-07	–
BRAINPC2.rsa	3.6E-12	6.4E-12	8.1E-12	3.5E-12
BRATU3D.RSA	3.2E-13	–	3.6E-10	1.7E-12
c-55.RSA	2.3E-14	4.9E-12	4.3E-13	4.4E-15
c-58.RSA	1.5E-13	2.8E-13	3.5E-13	–
c-59.RSA	8.3E-15	3.1E-11	2.3E-13	6.5E-15
c-62.RSA	3.5E-13	3.0E-11	4.9E-13	–
c-63.RSA	6.3E-15	4.2E-12	9.1E-13	2.3E-15
c-68.RSA	7.7E-16	2.0E-14	2.3E-15	–
c-69.RSA	4.0E-13	6.0E-12	4.3E-13	6.8E-16
c-70.RSA	4.6E-14	1.3E-12	2.8E-13	2.0E-16
c-71.RSA	8.4E-13	6.7E-12	1.5E-12	–
c-72.RSA	1.4E-13	1.1E-12	2.3E-13	1.1E-15
CONT-201.RSA	8.3E-14	–	1.6E-12	8.9E-14
CONT-300.RSA	1.6E-13	–	1.8E-12	1.1E-13
copter2.rsa	2.8E-13	3.2E-12	1.7E-12	9.8E-14
crystk02.RSA	4.9E-15	3.4E-15	2.1E-15	3.2E-15
crystk03.RSA	6.7E-15	4.5E-15	2.7E-15	4.2E-15
DARCY003.rsa	6.2E-16	3.0E-15	1.4E-15	5.0E-16
dawson5.rsa	7.3E-14	8.5E-13	2.7E-13	3.4E-14
DIXMAANL.rsa	1.5E-16	1.1E-15	3.8E-16	1.7E-16
DTOC.mat	–	6.3E-15	–	6.8E-14
D.PRETOK.rsa	9.1E-16	4.4E-16	3.1E-16	5.0E-16
HELM2D03.rsa	5.9E-13	4.1E-12	1.6E-12	1.4E-13
HELM3D01.rsa	1.3E-13	1.0E-12	4.1E-13	6.1E-14
K1_SAN.rsa	4.7E-15	2.9E-15	1.7E-15	1.8E-15
LINVERSE.rsa	1.6E-16	1.7E-16	1.9E-16	1.9E-16
mario001.rsa	5.4E-16	2.0E-15	9.8E-16	4.5E-16
mario002.rsa	6.2E-16	3.0E-15	1.4E-15	5.0E-16
NCVXBQP1.rsa	6.5E-15	9.1E-14	3.1E-14	2.2E-15
NCVXQP1.mat	1.1E-15	–	4.9E-16	5.6E-16
NCVXQP3.rsa	5.1E-13	–	3.3E-12	–
NCVXQP5.rsa	1.9E-13	–	7.7E-13	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	7.0E-24	6.0E-21	2.1E-23	7.8E-24
olesnik0.rsa	5.2E-16	2.0E-15	4.6E-16	3.1E-16
qa8fk.RSA	1.6E-13	5.8E-14	2.6E-14	5.8E-14
SIT100.rsa	1.0E-15	1.2E-15	9.0E-16	2.0E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	4.1E-16	1.2E-14	2.3E-15	4.7E-16
stokes128.mat	4.5E-13	3.5E-13	1.0E-12	1.4E-13
stokes64.mat	2.1E-13	2.8E-14	1.3E-13	2.5E-13
stokes64s.mat	8.1E-15	7.2E-15	1.7E-14	1.1E-13
tuma1.mat	3.6E-15	2.1E-15	1.6E-14	3.1E-14
tuma2.mat	2.6E-15	3.0E-15	1.3E-14	3.0E-14
TURON_M.rsa	1.4E-15	2.0E-15	9.8E-16	7.1E-16
vibrobox.RSA	8.2E-16	2.6E-16	3.2E-16	4.3E-16

Table 3.2.3.13: Norm of scaled residuals following a single refinement

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	7.5E-17	1.4E-16	1.4E-16	7.7E-17
A2NNSNSL.rsa	3.9E-17	4.6E-17	3.3E-17	3.7E-17
A5ESINDL.rsa	4.8E-17	3.3E-17	7.2E-17	1.2E-16
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	5.1E-17	5.3E-17	5.4E-17	4.6E-17
bcsstk35.RSA	2.9E-16	4.2E-16	4.3E-16	3.7E-16
bcsstk37.RSA	9.2E-16	9.7E-16	9.3E-16	9.3E-16
bcsstk39.RSA	2.3E-16	2.2E-16	2.2E-16	2.3E-16
BLOCKQP1.rsa	2.4E-15	4.8E-14	4.9E-14	4.9E-14
BLOWEYA.rsa	1.8E-13	6.1E-14	1.8E-13	1.8E-13
bmw3_2.rsa	1.7E-16	4.1E-16	2.2E-16	5.0E-16
BOYD1.RSA	5.7E-15	1.3E-14	9.4E-15	3.5E-15
BOYD2.RSA	–	2.2E-15	2.1E-15	–
BRAINPC2.rsa	6.3E-15	6.7E-15	6.3E-15	6.5E-15
BRATU3D.RSA	1.3E-15	–	1.3E-15	1.3E-15
c-55.RSA	5.9E-16	6.5E-16	6.6E-16	6.1E-16
c-58.RSA	3.0E-15	3.0E-15	2.7E-15	–
c-59.RSA	9.4E-15	9.8E-15	1.0E-14	2.9E-15
c-62.RSA	7.3E-16	1.0E-15	1.0E-15	–
c-63.RSA	1.4E-16	3.9E-16	4.1E-17	3.1E-16
c-68.RSA	5.9E-17	5.9E-17	1.2E-17	–
c-69.RSA	1.2E-16	1.6E-16	1.9E-16	1.1E-16
c-70.RSA	2.9E-16	2.9E-16	2.9E-16	2.9E-16
c-71.RSA	4.2E-15	3.4E-15	3.3E-15	–
c-72.RSA	1.5E-15	1.6E-15	1.6E-15	1.6E-15
CONT-201.RSA	2.4E-15	–	2.4E-15	2.4E-15
CONT-300.RSA	2.6E-15	–	2.6E-15	2.6E-15
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.4E-15	1.5E-15	1.5E-15	1.4E-15
crystk03.RSA	1.9E-15	1.8E-15	1.8E-15	1.8E-15
DARCY003.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
dawson5.rsa	2.3E-16	2.3E-16	2.3E-16	2.3E-16
DIXMAANL.rsa	9.5E-17	9.7E-17	9.5E-17	9.4E-17
DTOC.mat	–	3.5E-15	–	4.5E-14
D_PRETOK.rsa	9.6E-17	9.1E-17	9.2E-17	9.3E-17
HELM2D03.rsa	3.9E-15	3.9E-15	3.9E-15	3.9E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.1E-16	1.2E-16	1.1E-16	1.0E-16
LINVERSE.rsa	9.3E-17	9.3E-17	9.4E-17	9.4E-17
mario001.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
mario002.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.2E-16	1.2E-16
NCVXQP1.mat	1.2E-16	–	1.2E-16	1.2E-16
NCVXQP3.rsa	1.5E-16	–	1.5E-16	–
NCVXQP5.rsa	1.4E-16	–	1.4E-16	–
NCVXQP7.rsa	–	–	–	–

Table 3.2.3.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA57	MA67
NCVXQP9.mat	3.4E-24	5.8E-24	6.1E-24	2.3E-24
olesnik0.rsa	8.2E-17	8.5E-17	7.8E-17	7.7E-17
qa8fk.RSA	1.6E-13	2.0E-14	1.0E-14	5.0E-14
SIT100.rsa	2.6E-16	2.6E-16	2.7E-16	4.7E-16
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	1.2E-16	1.4E-16	1.3E-16	1.2E-16
stokes128.mat	1.9E-13	4.1E-13	2.5E-12	1.1E-13
stokes64.mat	5.7E-13	2.3E-14	6.5E-13	7.2E-13
stokes64s.mat	1.1E-14	8.1E-15	2.1E-14	3.3E-13
tuma1.mat	9.5E-17	9.4E-17	9.5E-17	9.3E-17
tuma2.mat	9.3E-17	9.5E-17	9.4E-17	9.3E-17
TURON_M.rsa	1.4E-16	1.4E-16	3.2E-16	1.4E-16
vibrobox.RSA	1.4E-16	2.0E-16	1.2E-16	1.6E-16

3.2.4 Runs with small threshold pivot tolerance on scaled matrices

Here are the results obtained with small ($u = 10^{-10}$) threshold pivoting parameter after the original matrix has been scaled by MC30.

Table 3.2.4.1: Return code

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	0	0	-99	6
AUG2DC.mat	0	0	-99	6
AUG3D.mat	0	0	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	0	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	-13	-13	-13	-13
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	0
c-72.RSA	0	0	0	0

Table 3.2.4.1: Return code (continued)

Name	MA27	MA47	MA57	MA67
CONT-201.RSA	-13	-99	-13	0
CONT-300.RSA	-13	-99	-13	0
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	0	-99	6
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	0	0	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	0	0	0
NCVXQP3.rsa	0	-99	0	-99
NCVXQP5.rsa	0	0	0	0
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-2	-2	-99
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0
vibrobox.RSA	0	0	0	0

Table 3.2.4.2: Total time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	22.901	57.641	10.510	29.656
A2NNSNSL.rsa	24.332	49.792	11.424	27.318
A5ESINDL.rsa	6.622	19.453	4.468	16.629
AUG2D.mat	196.644	0.138	—	0.104
AUG2DC.mat	263.215	0.169	—	0.113
AUG3D.mat	916.052	0.299	1026.711	0.085
AUG3DCQP.mat	1.668	1.802	1.290	2.997
bcsstk35.RSA	2.849	2.255	2.237	2.658
bcsstk37.RSA	3.310	2.857	2.458	3.175

Table 3.2.4.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
bcsstk39.RSA	11.367	7.592	6.450	12.075
BLOCKQP1.rsa	89.937	146.950	28.098	32.092
BLOWEYA.rsa	2.765	1.632	1.750	4.255
bmw3_2.rsa	402.013	240.923	122.195	221.198
BOYD1.RSA	698.888	648.363	176.586	488.748
BOYD2.RSA	1334.524	2317.457	1395.131	2550.462
BRAINPC2.rsa	1.053	7.182	1.188	2.592
BRATU3D.RSA	—	—	—	—
c-55.RSA	49.030	27.461	18.417	41.605
c-58.RSA	17.317	16.532	18.944	20.793
c-59.RSA	24.190	18.254	15.158	39.712
c-62.RSA	159.575	125.031	55.572	117.187
c-63.RSA	8.304	7.581	5.328	9.607
c-68.RSA	98.743	63.702	57.419	150.683
c-69.RSA	8.718	6.330	4.759	10.366
c-70.RSA	24.953	18.216	14.442	25.520
c-71.RSA	376.068	308.911	153.299	378.593
c-72.RSA	12.703	10.991	7.935	18.768
CONT-201.RSA	—	—	—	7.646
CONT-300.RSA	—	—	—	24.650
copter2.rsa	110.588	90.033	31.735	72.044
crystk02.RSA	15.505	17.396	12.022	15.061
crystk03.RSA	96.135	45.335	24.677	44.149
DARCY003.rsa	8.954	14.732	7.383	18.352
dawson5.rsa	7.300	6.891	4.649	17.577
DIXMAANL.rsa	0.368	0.611	0.487	1.035
DTOC.mat	—	0.230	—	0.093
D_PRETOK.rsa	231.568	188.174	46.208	233.156
HELM2D03.rsa	87.648	72.323	38.989	70.529
HELM3D01.rsa	50.079	40.165	20.105	33.376
K1_SAN.rsa	12.592	11.199	4.025	13.770
LINVERSE.rsa	0.052	0.077	0.061	0.108
mario001.rsa	0.452	0.834	0.454	1.134
mario002.rsa	8.955	14.720	7.386	18.426
NCVXBQP1.rsa	27.878	26.522	9.188	12.211
NCVXQP1.mat	43.684	371.148	22.801	18.605
NCVXQP3.rsa	2861.222	—	1231.139	—
NCVXQP5.rsa	783.378	621.967	355.843	457.547
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	0.289	6.696	0.286	0.704
olesnik0.rsa	15.020	17.278	6.235	19.947
qa8fk.RSA	646.290	282.592	180.686	470.821
SIT100.rsa	0.862	1.739	1.116	1.943
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.152	0.186	0.160	0.207
stokes128.mat	3.101	3.181	1.823	7.699
stokes64.mat	0.444	0.572	0.330	1.292
stokes64s.mat	0.434	0.571	0.332	1.290

Table 3.2.4.2: Total time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
tuma1.mat	0.673	0.676	0.415	1.318
tuma2.mat	0.235	0.290	0.164	0.590
TURON_M.rsa	164.015	202.304	41.096	223.356
vibrobox.RSA	7.725	4.607	2.936	10.541

Table 3.2.4.3: Analyse time (CPU seconds)

Name	MA27	MA47	MA57
A0NSDSIL.rsa	22.592	57.356	10.207
A2NNSNSL.rsa	24.044	49.512	11.130
A5ESINDL.rsa	6.443	19.271	4.276
AUG2D.mat	0.080	0.103	—
AUG2DC.mat	0.081	0.131	—
AUG3D.mat	0.115	0.269	0.075
AUG3DCQP.mat	0.164	0.342	0.121
bcsstk35.RSA	0.331	0.409	0.319
bcsstk37.RSA	0.253	0.341	0.267
bcsstk39.RSA	0.511	0.627	0.541
BLOCKQP1.rsa	89.504	146.639	27.798
BLOWEYA.rsa	2.680	1.551	1.643
bmw3_2.rsa	3.048	3.914	2.764
BOYD1.RSA	698.326	647.964	107.795
BOYD2.RSA	1333.190	2316.019	687.379
BRAINPC2.rsa	0.959	7.080	1.085
BRATU3D.RSA	—	—	—
c-55.RSA	1.735	1.548	0.378
c-58.RSA	3.293	2.683	0.661
c-59.RSA	2.078	1.778	0.484
c-62.RSA	4.416	3.627	0.686
c-63.RSA	1.129	1.049	0.372
c-68.RSA	5.869	4.289	0.690
c-69.RSA	1.864	1.676	0.581
c-70.RSA	1.972	1.847	0.607
c-71.RSA	7.535	5.950	1.125
c-72.RSA	2.003	2.022	0.732
CONT-201.RSA	—	—	—
CONT-300.RSA	—	—	—
copter2.rsa	1.299	1.927	0.695
crystk02.RSA	0.237	0.334	0.208
crystk03.RSA	0.491	0.660	0.409
DARCY003.rsa	2.502	7.927	2.605
dawson5.rsa	0.676	1.021	0.460
DIXMAANL.rsa	0.164	0.411	0.219
DTOC.mat	0.034	0.198	—
D_PRETOK.rsa	1.025	2.943	0.998
HELM2D03.rsa	3.510	5.684	3.145
HELM3D01.rsa	0.826	1.351	0.435

Table 3.2.4.3: Analyse time (CPU seconds) (continued)

Name	MA27	MA47	MA57
K1_SAN.rsa	0.327	1.053	0.311
LINVERSE.rsa	0.023	0.045	0.028
mario001.rsa	0.149	0.468	0.148
mario002.rsa	2.490	7.931	2.607
NCVXBQP1.rsa	0.535	1.024	0.465
NCVXQP1.mat	0.712	15.206	0.141
NCVXQP3.rsa	36.860	–	2.064
NCVXQP5.rsa	7.108	118.698	1.191
NCVXQP7.rsa	–	–	–
NCVXQP9.mat	0.079	3.151	0.061
olesnik0.rsa	0.488	1.425	0.446
qa8fk.RSA	2.540	3.497	1.057
SIT100.rsa	0.046	0.128	0.042
SPARSINE.rsa	–	–	–
SPMSRTLS.rsa	0.066	0.104	0.070
stokes128.mat	0.261	0.955	0.219
stokes64.mat	0.064	0.200	0.048
stokes64s.mat	0.060	0.199	0.049
tuma1.mat	0.075	0.142	0.068
tuma2.mat	0.044	0.080	0.039
TURON_M.rsa	1.124	3.384	1.050
vibrobox.RSA	0.319	0.431	0.175

Table 3.2.4.4: Factorize time (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.271	0.217	0.265	29.609
A2NNSNSL.rsa	0.259	0.218	0.256	27.270
A5ESINDL.rsa	0.163	0.137	0.169	16.597
AUG2D.mat	196.435	0.029	–	0.098
AUG2DC.mat	262.986	0.031	–	0.104
AUG3D.mat	915.580	0.025	1026.128	0.081
AUG3DCQP.mat	1.472	1.407	1.132	2.951
bcsstk35.RSA	2.424	1.757	1.819	2.557
bcsstk37.RSA	2.974	2.426	2.067	3.011
bcsstk39.RSA	10.650	6.755	5.687	11.788
BLOCKQP1.rsa	0.409	0.255	0.270	32.059
BLOWEYA.rsa	0.078	0.068	0.097	4.242
bmw3_2.rsa	397.605	235.434	118.023	219.575
BOYD1.RSA	0.512	0.307	68.311	488.670
BOYD2.RSA	1.184	1.043	706.587	2550.179
BRAINPC2.rsa	0.086	0.086	0.091	2.576
BRATU3D.RSA	–	–	–	–
c-55.RSA	47.170	25.768	17.922	41.469
c-58.RSA	13.957	13.759	18.209	20.718
c-59.RSA	22.022	16.360	14.581	39.611
c-62.RSA	154.874	120.959	54.593	116.905

Table 3.2.4.4: Factorize time (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
c-63.RSA	7.097	6.439	4.866	9.521
c-68.RSA	92.685	59.208	56.545	150.484
c-69.RSA	6.769	4.534	4.087	10.258
c-70.RSA	22.864	16.210	13.701	25.377
c-71.RSA	368.054	302.435	151.714	378.052
c-72.RSA	10.593	8.815	7.082	18.631
CONT-201.RSA	—	—	—	7.472
CONT-300.RSA	—	—	—	24.195
copter2.rsa	108.921	87.617	30.667	71.574
crystk02.RSA	15.149	16.910	11.672	14.897
crystk03.RSA	95.338	44.356	23.985	43.798
DARCY003.rsa	6.120	6.371	4.397	17.758
dawson5.rsa	6.486	5.697	4.045	17.383
DIXMAANL.rsa	0.181	0.154	0.238	0.994
DTOC.mat	—	0.026	—	0.086
D_PRETOK.rsa	229.798	184.151	44.518	231.865
HELM2D03.rsa	83.211	65.496	34.892	69.261
HELM3D01.rsa	49.073	38.588	19.479	33.166
K1_SAN.rsa	12.104	9.926	3.572	13.537
LINVERSE.rsa	0.025	0.025	0.028	0.103
mario001.rsa	0.279	0.335	0.280	1.098
mario002.rsa	6.125	6.361	4.403	17.828
NCVXBQP1.rsa	27.201	25.322	8.595	12.056
NCVXQP1.mat	42.874	355.790	22.566	18.578
NCVXQP3.rsa	2821.684	—	1227.351	—
NCVXQP5.rsa	775.297	502.548	353.778	457.044
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	0.202	3.537	0.215	0.693
olesnik0.rsa	14.323	15.565	5.593	19.617
qa8fk.RSA	642.699	277.967	178.655	469.480
SIT100.rsa	0.795	1.578	1.049	1.910
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.079	0.064	0.079	0.194
stokes128.mat	2.745	2.121	1.511	7.551
stokes64.mat	0.362	0.354	0.267	1.265
stokes64s.mat	0.358	0.353	0.268	1.263
tuma1.mat	0.578	0.509	0.328	1.285
tuma2.mat	0.183	0.199	0.118	0.576
TURON_M.rsa	162.199	197.798	39.390	221.770
vibrobox.RSA	7.344	4.116	2.705	10.472

Table 3.2.4.5: Solution time given factors (CPU seconds)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	0.037	0.068	0.037	0.047
A2NNSNSL.rsa	0.029	0.061	0.038	0.048
A5ESINDL.rsa	0.017	0.045	0.023	0.032

Table 3.2.4.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
AUG2D.mat	0.130	0.005	–	0.007
AUG2DC.mat	0.148	0.007	–	0.009
AUG3D.mat	0.357	0.004	0.508	0.004
AUG3DCQP.mat	0.032	0.053	0.037	0.046
bcsstk35.RSA	0.094	0.089	0.099	0.101
bcsstk37.RSA	0.083	0.090	0.123	0.164
bcsstk39.RSA	0.206	0.211	0.223	0.287
BLOCKQP1.rsa	0.024	0.057	0.029	0.033
BLOWEYA.rsa	0.007	0.013	0.011	0.014
bmw3_2.rsa	1.361	1.575	1.408	1.623
BOYD1.RSA	0.050	0.091	0.479	0.078
BOYD2.RSA	0.150	0.395	1.165	0.282
BRAINPC2.rsa	0.008	0.017	0.012	0.017
BRATU3D.RSA	–	–	–	–
c-55.RSA	0.125	0.144	0.117	0.136
c-58.RSA	0.067	0.091	0.074	0.075
c-59.RSA	0.090	0.116	0.093	0.102
c-62.RSA	0.285	0.446	0.294	0.282
c-63.RSA	0.077	0.093	0.090	0.086
c-68.RSA	0.189	0.205	0.184	0.199
c-69.RSA	0.085	0.120	0.092	0.108
c-70.RSA	0.117	0.159	0.134	0.143
c-71.RSA	0.464	0.526	0.460	0.542
c-72.RSA	0.107	0.153	0.121	0.138
CONT-201.RSA	–	–	–	0.174
CONT-300.RSA	–	–	–	0.455
copter2.rsa	0.368	0.489	0.373	0.470
crystk02.RSA	0.118	0.152	0.142	0.164
crystk03.RSA	0.306	0.319	0.283	0.351
DARCY003.rsa	0.331	0.433	0.382	0.593
dawson5.rsa	0.139	0.173	0.144	0.194
DIXMAANL.rsa	0.023	0.046	0.030	0.041
DTOC.mat	1.434	0.006	–	0.007
D_PRETOK.rsa	0.745	1.080	0.691	1.290
HELM2D03.rsa	0.927	1.142	0.953	1.268
HELM3D01.rsa	0.180	0.226	0.190	0.210
K1_SAN.rsa	0.161	0.220	0.142	0.233
LINVERSE.rsa	0.003	0.007	0.004	0.005
mario001.rsa	0.023	0.031	0.025	0.036
mario002.rsa	0.333	0.428	0.377	0.598
NCVXBQP1.rsa	0.142	0.176	0.129	0.155
NCVXQP1.mat	0.099	0.152	0.095	0.026
NCVXQP3.rsa	1.968	–	1.720	–
NCVXQP5.rsa	0.973	0.720	0.874	0.502
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.008	0.009	0.010	0.011
olesnik0.rsa	0.209	0.288	0.195	0.331
qa8fk.RSA	1.051	1.128	0.974	1.341

Table 3.2.4.5: Solution time given factors (CPU seconds) (continued)

Name	MA27	MA47	MA57	MA67
SIT100.rsa	0.020	0.033	0.024	0.033
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.007	0.018	0.011	0.013
stokes128.mat	0.095	0.105	0.094	0.147
stokes64.mat	0.018	0.018	0.015	0.027
stokes64s.mat	0.017	0.019	0.015	0.027
tuma1.mat	0.020	0.024	0.019	0.032
tuma2.mat	0.008	0.011	0.007	0.015
TURON_M.rsa	0.691	1.122	0.656	1.586
vibrobox.RSA	0.061	0.060	0.056	0.068

Table 3.2.4.6: Minimum memory required (Mbytes)

Name	MA57	MA67
A0NSDSL.rsa	1.4E+01	1.9E+01
A2NNSNSL.rsa	1.3E+01	1.8E+01
A5ESINDL.rsa	9.2E+00	1.4E+01
AUG2D.mat	—	4.6E+00
AUG2DC.mat	—	4.8E+00
AUG3D.mat	2.6E+03	4.0E+00
AUG3DCQP.mat	1.9E+01	2.5E+01
bcsstk35.RSA	4.6E+01	4.6E+01
bcsstk37.RSA	4.4E+01	4.5E+01
bcsstk39.RSA	8.9E+01	1.1E+02
BLOCKQP1.rsa	1.6E+01	2.5E+01
BLOWEYA.rsa	5.1E+00	8.1E+00
bmw3_2.rsa	7.0E+02	8.4E+02
BOYD1.RSA	2.5E+02	5.6E+01
BOYD2.RSA	1.5E+03	9.2E+01
BRAINPC2.rsa	5.8E+00	9.2E+00
BRATU3D.RSA	—	—
c-55.RSA	1.1E+02	1.3E+02
c-58.RSA	9.0E+01	7.1E+01
c-59.RSA	8.4E+01	9.9E+01
c-62.RSA	1.9E+02	2.7E+02
c-63.RSA	4.3E+01	5.4E+01
c-68.RSA	2.0E+02	2.3E+02
c-69.RSA	4.3E+01	5.5E+01
c-70.RSA	9.9E+01	1.2E+02
c-71.RSA	4.6E+02	5.6E+02
c-72.RSA	6.3E+01	8.7E+01
CONT-201.RSA	—	6.6E+01
CONT-300.RSA	—	1.7E+02
copter2.rsa	1.6E+02	2.3E+02
crystk02.RSA	8.5E+01	9.7E+01
crystk03.RSA	1.5E+02	2.0E+02
DARCY003.rsa	1.1E+02	1.5E+02

Table 3.2.4.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA67
dawson5.rsa	6.3E+01	9.4E+01
DIXMAANL.rsa	1.2E+01	1.6E+01
DTOC.mat	–	4.1E+00
D_PRETOK.rsa	2.8E+02	5.8E+02
HELM2D03.rsa	3.3E+02	4.0E+02
HELM3D01.rsa	1.2E+02	1.5E+02
K1_SAN.rsa	5.2E+01	9.6E+01
LINVERSE.rsa	2.7E+00	4.6E+00
mario001.rsa	9.6E+00	1.2E+01
mario002.rsa	1.1E+02	1.5E+02
NCVXBQP1.rsa	7.5E+01	8.4E+01
NCVXQP1.mat	9.4E+01	2.2E+01
NCVXQP3.rsa	1.4E+03	–
NCVXQP5.rsa	7.3E+02	3.8E+02
NCVXQP7.rsa	–	–
NCVXQP9.mat	5.2E+00	3.4E+00
olesnik0.rsa	7.5E+01	1.3E+02
qa8fk.RSA	4.7E+02	8.1E+02
SIT100.rsa	1.3E+01	1.8E+01
SPARSINE.rsa	–	–
SPMSRTLS.rsa	6.0E+00	8.4E+00
stokes128.mat	3.4E+01	6.0E+01
stokes64.mat	7.6E+00	1.2E+01
stokes64s.mat	7.6E+00	1.2E+01
tuma1.mat	8.7E+00	1.6E+01
tuma2.mat	4.0E+00	8.3E+00
TURON_M.rsa	2.6E+02	5.7E+02
vibrobox.RSA	3.3E+01	6.3E+01

Table 3.2.4.7: Actual memory used (Mbytes)

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.2E+01	1.3E+01	1.5E+01	2.4E+01
A2NNSNSL.rsa	1.1E+01	1.3E+01	1.4E+01	2.4E+01
A5ESINDL.rsa	7.4E+00	8.4E+00	1.0E+01	1.8E+01
AUG2D.mat	9.9E+02	2.4E+00	–	5.4E+00
AUG2DC.mat	8.1E+02	2.5E+00	–	5.6E+00
AUG3D.mat	1.5E+03	2.1E+00	3.1E+03	4.7E+00
AUG3DCQP.mat	1.4E+01	2.1E+01	2.0E+01	4.2E+01
bcsstk35.RSA	4.6E+01	4.8E+01	5.3E+01	6.8E+01
bcsstk37.RSA	4.4E+01	4.8E+01	4.9E+01	8.0E+01
bcsstk39.RSA	1.0E+02	9.9E+01	1.0E+02	2.4E+02
BLOCKQP1.rsa	2.6E+01	1.8E+01	1.9E+01	4.3E+01
BLOWEYA.rsa	4.1E+00	4.7E+00	5.7E+00	9.3E+00
bmw3.2.rsa	7.2E+02	8.4E+02	7.9E+02	1.3E+03
BOYD1.RSA	2.9E+01	3.6E+01	2.6E+02	1.2E+02
BOYD2.RSA	4.5E+01	5.7E+01	1.5E+03	1.2E+02

Table 3.2.4.7: Actual memory used (Mbytes) (continued)

Name	MA27	MA47	MA57	MA67
BRAINPC2.rsa	4.6E+00	5.3E+00	6.3E+00	8.4E+00
BRATU3D.RSA	—	—	—	—
c-55.RSA	8.2E+01	1.1E+02	1.2E+02	2.6E+02
c-58.RSA	7.4E+01	7.4E+01	9.9E+01	1.7E+02
c-59.RSA	6.0E+01	8.9E+01	9.0E+01	2.9E+02
c-62.RSA	1.5E+02	2.3E+02	2.2E+02	7.0E+02
c-63.RSA	3.8E+01	5.2E+01	4.7E+01	7.9E+01
c-68.RSA	1.2E+02	1.8E+02	2.0E+02	1.5E+03
c-69.RSA	4.4E+01	4.7E+01	4.9E+01	1.1E+02
c-70.RSA	6.3E+01	9.5E+01	1.1E+02	2.1E+02
c-71.RSA	3.3E+02	5.0E+02	4.9E+02	2.1E+03
c-72.RSA	5.3E+01	7.2E+01	6.8E+01	1.3E+02
CONT-201.RSA	—	—	—	1.2E+02
CONT-300.RSA	—	—	—	2.6E+02
copter2.rsa	1.9E+02	2.7E+02	1.8E+02	5.0E+02
crystk02.RSA	7.2E+01	9.9E+01	9.7E+01	2.0E+02
crystk03.RSA	1.7E+02	1.9E+02	1.7E+02	3.4E+02
DARCY003.rsa	1.0E+02	1.2E+02	1.1E+02	2.1E+02
dawson5.rsa	6.5E+01	7.6E+01	7.0E+01	1.6E+02
DIXMAANL.rsa	9.5E+00	1.1E+01	1.3E+01	2.0E+01
DTOC.mat	6.9E+02	2.1E+00	—	4.8E+00
D_PRETOK.rsa	3.4E+02	5.0E+02	3.1E+02	9.7E+02
HELM2D03.rsa	3.3E+02	4.1E+02	3.5E+02	5.3E+02
HELM3D01.rsa	9.6E+01	1.5E+02	1.3E+02	2.8E+02
K1_SAN.rsa	7.0E+01	8.6E+01	5.6E+01	1.8E+02
LINVERSE.rsa	2.2E+00	3.0E+00	2.9E+00	6.7E+00
mario001.rsa	8.6E+00	9.8E+00	1.0E+01	2.1E+01
mario002.rsa	1.0E+02	1.2E+02	1.1E+02	2.1E+02
NCVXBQP1.rsa	6.9E+01	1.2E+02	7.8E+01	1.3E+02
NCVXQP1.mat	7.1E+01	1.4E+02	1.0E+02	4.5E+01
NCVXQP3.rsa	1.2E+03	—	1.5E+03	—
NCVXQP5.rsa	5.6E+02	2.4E+03	8.4E+02	1.2E+03
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	4.1E+00	5.2E+00	5.7E+00	4.5E+00
olesnik0.rsa	8.8E+01	1.2E+02	8.1E+01	2.4E+02
qa8fk.RSA	5.5E+02	5.5E+02	5.3E+02	1.0E+03
SIT100.rsa	8.5E+00	1.8E+01	1.4E+01	2.2E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	5.1E+00	6.6E+00	6.4E+00	7.8E+00
stokes128.mat	3.8E+01	3.6E+01	3.5E+01	1.4E+02
stokes64.mat	7.9E+00	8.3E+00	8.1E+00	2.0E+01
stokes64s.mat	7.9E+00	8.3E+00	8.1E+00	2.0E+01
tuma1.mat	8.8E+00	1.1E+01	9.1E+00	2.8E+01
tuma2.mat	4.1E+00	5.9E+00	4.3E+00	1.6E+01
TURON_M.rsa	3.1E+02	5.2E+02	2.8E+02	1.0E+03
vibrobox.RSA	3.6E+01	4.1E+01	3.6E+01	1.2E+02

Table 3.2.4.8: Number of integers used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	420005	165033	499964	499235
A2NNSNSL.rsa	400462	165264	476517	483981
A5ESINDL.rsa	274998	135003	335003	337813
AUG2D.mat	236054	86439	–	86439
AUG2DC.mat	255342	90003	–	90003
AUG3D.mat	305974	64155	319170	64155
AUG3DCQP.mat	204350	142864	237520	239049
bcsstk35.RSA	230149	215475	227235	231841
bcsstk37.RSA	206951	190371	204333	210022
bcsstk39.RSA	409702	385098	395732	527808
BLOCKQP1.rsa	380005	190021	399890	400020
BLOWEYA.rsa	130000	108010	140001	143894
bmw3.2.rsa	2130653	1976240	2080352	2122256
BOYD1.RSA	745513	242571	435270	849522
BOYD2.RSA	1729444	890092	2140797	2200919
BRAINPC2.rsa	138009	89693	151810	189725
BRATU3D.RSA	–	–	–	–
c-55.RSA	453823	243314	432974	436571
c-58.RSA	533917	271936	571050	551905
c-59.RSA	502095	271025	500207	497492
c-62.RSA	664042	345693	605110	634817
c-63.RSA	417254	229076	428798	431128
c-68.RSA	892684	450128	754158	754632
c-69.RSA	567090	319410	600132	601234
c-70.RSA	631664	340126	647169	668120
c-71.RSA	1211609	609157	1033717	1100112
c-72.RSA	722279	385637	738899	746547
CONT-201.RSA	–	–	–	786995
CONT-300.RSA	–	–	–	1786393
copter2.rsa	846016	515896	841598	868835
crystk02.RSA	182504	146351	173257	208115
crystk03.RSA	330928	271630	317983	381597
DARCY003.rsa	1962217	2304494	1937373	2837030
dawson5.rsa	570294	346612	564145	630796
DIXMAANL.rsa	349980	129997	459959	365002
DTOC.mat	–	84974	–	84974
D_PRETOK.rsa	1347193	1545253	1305410	2345207
HELM2D03.rsa	3623306	2135055	3744078	3754474
HELM3D01.rsa	482630	262051	482270	478550
K1_SAN.rsa	469070	531872	442337	668775
LINVERSE.rsa	41992	21999	41989	41994
mario001.rsa	189632	221592	186966	269570
mario002.rsa	1962217	2304494	1937373	2837030
NCVXBQP1.rsa	502641	285057	517265	511422
NCVXQP1.mat	215851	2634852	198136	248972
NCVXQP3.rsa	2524772	–	2084284	–
NCVXQP5.rsa	1210196	1187913	1230776	1289957
NCVXQP7.rsa	–	–	–	–

Table 3.2.4.8: Number of integers used for factors (continued)

Name	MA27	MA47	MA57	MA67
NCVXQP9.mat	82124	118618	91814	120789
olesnik0.rsa	614858	715379	581713	987325
qa8fk.RSA	1539848	886262	1861292	1499241
SIT100.rsa	80974	61220	86603	103051
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	119975	54990	129970	129975
stokes128.mat	317322	597377	306893	616798
stokes64.mat	78407	143908	76565	149774
stokes64s.mat	78407	144256	76565	149462
tuma1.mat	127257	77363	122997	141361
tuma2.mat	69924	42231	67108	77995
TURON_M.rsa	1393905	1631644	1339403	2394722
vibrobox.RSA	216697	110574	217871	204590

Table 3.2.4.9: Number of reals used for factors

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	340031	677578	340046	339250
A2NNSNSL.rsa	324392	663023	324407	327900
A5ESINDL.rsa	215002	369991	215002	217814
AUG2D.mat	6510270	57624	—	57624
AUG2DC.mat	7693508	60000	—	60000
AUG3D.mat	18854488	46656	20253212	46656
AUG3DCQP.mat	1003491	1172866	958084	1155605
bcsstk35.RSA	2878066	2863548	2730502	2890987
bcsstk37.RSA	3004411	3077462	2824145	3058994
bcsstk39.RSA	7852736	7286742	6688229	9082570
BLOCKQP1.rsa	380068	880041	380113	380068
BLOWEYA.rsa	140006	120008	140008	109174
bmw3_2.rsa	59779026	59315280	52963395	60837463
BOYD1.RSA	652378	839309	26694808	663069
BOYD2.RSA	1263167	2691532	61603776	1268311
BRAINPC2.rsa	158697	225887	158695	165589
BRATU3D.RSA	—	—	—	—
c-55.RSA	5168011	5431197	4712382	5419598
c-58.RSA	2365903	2680683	2270842	2401958
c-59.RSA	3279860	3765547	3285590	3528907
c-62.RSA	10933899	11223776	10464882	11744648
c-63.RSA	2376334	2680826	2290982	2432551
c-68.RSA	6178885	7229548	6504445	6678823
c-69.RSA	2696315	2974070	2434497	2759767
c-70.RSA	4234877	4530495	4393890	4548089
c-71.RSA	20207062	22262175	20184253	23249327
c-72.RSA	3306942	3878417	3161838	3622251
CONT-201.RSA	—	—	—	4606386
CONT-300.RSA	—	—	—	12660460
copter2.rsa	17227168	19345989	14132982	17723567
crystk02.RSA	5852382	6352770	6098260	6544392

Table 3.2.4.9: Number of reals used for factors (continued)

Name	MA27	MA47	MA57	MA67
crystk03.RSA	14710431	13702950	11904216	14905712
DARCY003.rsa	7629544	7942073	6941313	8490941
dawson5.rsa	5211272	5566107	4624921	6288239
DIXMAANL.rsa	349980	509964	339981	374962
DTOC.mat	—	54980	—	54980
D_PRETOK.rsa	33445303	40897049	24528780	49655323
HELM2D03.rsa	31686809	34710612	28015793	31611947
HELM3D01.rsa	8145267	9030108	7629570	7901089
K1_SAN.rsa	6567121	7206266	4282567	7648608
LINVERSE.rsa	53988	77976	53988	53988
mario001.rsa	582494	577086	529699	579309
mario002.rsa	7629544	7942073	6941313	8490941
NCVXBQP1.rsa	5375688	6018010	4141288	4259239
NCVXQP1.mat	4751960	3902772	4487213	756062
NCVXQP3.rsa	95798699	—	78878572	—
NCVXQP5.rsa	38278060	26838894	38990831	18532244
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	279973	125778	262694	116505
olesnik0.rsa	8421776	9621913	6061585	10291436
qa8fk.RSA	51388343	46649779	40901710	58263681
SIT100.rsa	789586	1214010	906235	1140928
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129971	194950	129971	129971
stokes128.mat	3362745	2792212	2714396	4366306
stokes64.mat	664992	562687	557892	766888
stokes64s.mat	664992	563237	557892	767042
tuma1.mat	693312	684290	536123	870141
tuma2.mat	301225	329795	224253	388380
TURON_M.rsa	31248581	43308433	23258474	48514131
vibrobox.RSA	2672558	2329429	2086588	2680747

Table 3.2.4.10: Total number of integers used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	464972	400042	505049	1870292
A2NNSNSL.rsa	435954	392230	482995	1850762
A5ESINDL.rsa	280012	290008	340016	1429995
AUG2D.mat	147351	106044	—	540163
AUG2DC.mat	153655	110408	—	562387
AUG3D.mat	145750	89432	296000	465323
AUG3DCQP.mat	205903	210744	239580	928152
bcsstk35.RSA	740239	1480400	770442	1843254
bcsstk37.RSA	583264	1166480	608748	1472526
bcsstk39.RSA	1068081	2136066	1114810	2697340
BLOCKQP1.rsa	620028	680064	420062	2140515
BLOWEYA.rsa	140022	220027	150024	860093
bmw3.2.rsa	5758017	11515992	5985363	14244346

Table 3.2.4.10: Total number of integers used (continued)

Name	MA27	MA47	MA57	MA67
BOYD1.RSA	746195	1491014	838820	5327874
BOYD2.RSA	1765077	1822733	2288358	10009309
BRAINPC2.rsa	138042	193464	207060	993692
BRATU3D.RSA	—	—	—	—
c-55.RSA	468480	436230	448582	1907580
c-58.RSA	548100	590152	587826	1851305
c-59.RSA	514229	521818	510453	1835673
c-62.RSA	687191	601074	632337	3053609
c-63.RSA	422291	478938	433938	1639696
c-68.RSA	910381	630816	769246	4110048
c-69.RSA	572678	691428	604002	2402825
c-70.RSA	639584	727910	657874	2509026
c-71.RSA	1238837	936192	1062901	5226587
c-72.RSA	728498	791622	744548	2819634
CONT-201.RSA	—	—	—	2952146
CONT-300.RSA	—	—	—	6675664
copter2.rsa	857863	815428	866219	3897168
crystk02.RSA	491313	982548	505244	1150138
crystk03.RSA	887976	1775874	912638	2072236
DARCY003.rsa	2310376	2335370	1939303	10041316
dawson5.rsa	578306	1062314	582864	3177130
DIXMAANL.rsa	350000	359998	459984	1500006
DTOC.mat	—	94977	—	474851
D_PRETOK.rsa	1582490	1770832	1314332	6361531
HELM2D03.rsa	3629422	3134192	3752224	13057600
HELM3D01.rsa	495891	460670	496295	2209271
K1_SAN.rsa	551990	606728	445053	2236029
LINVERSE.rsa	59988	119976	71992	395853
mario001.rsa	223874	229286	187570	985686
mario002.rsa	2310376	2335370	1939303	10041316
NCVXBQP1.rsa	508195	499968	519658	1549847
NCVXQP1.mat	217435	2638716	208331	1238763
NCVXQP3.rsa	2363420	—	2119970	—
NCVXQP5.rsa	1236448	1447697	1258063	9589698
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	88993	125477	92584	351705
olesnik0.rsa	722127	805246	585541	2950222
qa8fk.RSA	1584913	1726706	1892539	9102363
SIT100.rsa	85967	68188	89006	316396
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129987	259942	159976	669884
stokes128.mat	447306	602026	362008	2798569
stokes64.mat	110599	148484	90904	628112
stokes64s.mat	110599	148484	90904	628112
tuma1.mat	142924	152398	124164	527334
tuma2.mat	78235	85870	67737	297580
TURON_M.rsa	1634660	1824690	1348714	6573196
vibrobox.RSA	226089	355156	230085	928621

Table 3.2.4.11: Total number of reals used

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	519807	677865	450038	800085
A2NNSNSL.rsa	463110	661253	409414	784461
A5ESINDL.rsa	249980	360092	249997	580017
AUG2D.mat	270709	76832	—	153657
AUG2DC.mat	288181	80000	—	159993
AUG3D.mat	693600	69984	328977068	139553
AUG3DCQP.mat	1243294	2076270	1726157	2402233
bcsstk35.RSA	2969697	3140370	2987166	3324375
bcsstk37.RSA	3174983	3727210	3264551	3700846
bcsstk39.RSA	8094097	8114804	7106639	10348218
BLOCKQP1.rsa	1700035	870300	420242	1200099
BLOWEYA.rsa	130012	180012	140055	330022
bmw3_2.rsa	64274845	79696497	66435907	86377271
BOYD1.RSA	838786	1491014	28289564	2662498
BOYD2.RSA	1542938	2585368	182449799	3520619
BRAINPC2.rsa	158766	224472	193323	386536
BRATU3D.RSA	—	—	—	—
c-55.RSA	8416233	12055150	13203567	14867810
c-58.RSA	7111004	7663565	9943532	7308464
c-59.RSA	5752783	9663910	9261228	10783179
c-62.RSA	15646102	25997746	22871375	31269656
c-63.RSA	3404098	5354438	4258834	5300571
c-68.RSA	11870180	20895325	23456529	25363266
c-69.RSA	3892702	4396108	3726913	4785859
c-70.RSA	5737156	10165741	10583360	12464317
c-71.RSA	36194417	59759819	54825009	66633947
c-72.RSA	4799099	7166448	5866470	8402131
CONT-201.RSA	—	—	—	6026006
CONT-300.RSA	—	—	—	16891608
copter2.rsa	19867719	30649328	18391275	26272687
crystk02.RSA	6517207	10186953	8827118	10523420
crystk03.RSA	16703368	19664285	15713960	21585232
DARCY003.rsa	6652597	8979269	7562066	10027459
dawson5.rsa	5599303	7092053	5752363	8949371
DIXMAANL.rsa	350020	510117	380038	719997
DTOC.mat	—	69972	—	139943
D_PRETOK.rsa	34869093	56371534	31152370	67553488
HELM2D03.rsa	33319047	42566587	32569973	39205259
HELM3D01.rsa	9972738	17173791	13761359	16877181
K1_SAN.rsa	6647640	9117156	4996624	10097300
LINVERSE.rsa	71987	119976	60021	221909
mario001.rsa	495098	676855	575236	666267
mario002.rsa	6652597	8979269	7562066	10027459
NCVXBQP1.rsa	6844070	13514155	8068030	9048759
NCVXQP1.mat	4084959	12013948	11398570	2043882
NCVXQP3.rsa	72921247	—	176798624	—
NCVXQP5.rsa	42371340	201273649	88843236	41849872
NCVXQP7.rsa	—	—	—	—

Table 3.2.4.11: Total number of reals used (continued)

Name	MA27	MA47	MA57	MA67
NCVXQP9.mat	171887	236581	423137	146712
olesnik0.rsa	8601487	12509601	7451672	13285361
qa8fk.RSA	58388401	63045819	55505819	94431201
SIT100.rsa	810208	2077990	1366649	1974063
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	159966	259942	130005	379919
stokes128.mat	3083370	3288162	2946251	5401628
stokes64.mat	599167	690910	622493	1050344
stokes64s.mat	599167	691460	622493	985449
tuma1.mat	697398	1051911	687742	1491761
tuma2.mat	299148	511882	277035	774708
TURON_M.rsa	32364595	58971869	28481724	66114396
vibrobox.RSA	3443649	4266057	3408950	7063315

Table 3.2.4.12: Norm of scaled residuals

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	8.9E-16	9.7E-16	1.3E-15	3.5E-15
A2NNSNSL.rsa	1.1E-15	6.3E-16	6.6E-16	6.6E-16
A5ESINDL.rsa	3.3E-14	2.5E-14	1.2E-14	2.4E-14
AUG2D.mat	0.0E+00	0.0E+00	—	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	—	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-16	1.3E-16	1.3E-16	1.3E-16
bcsstk35.RSA	7.0E-16	5.0E-16	2.0E-16	5.4E-16
bcsstk37.RSA	1.8E-15	1.2E-15	1.1E-15	1.2E-15
bcsstk39.RSA	4.9E-16	2.7E-16	2.6E-16	3.1E-16
BLOCKQP1.rsa	1.2E-12	1.8E-13	1.2E-12	4.2E-12
BLOWEYA.rsa	1.4E-13	1.5E-13	1.4E-13	1.5E-13
bmw3_2.rsa	2.9E-16	2.7E-16	3.9E-16	2.2E-16
BOYD1.RSA	1.9E-09	2.6E-10	2.5E-09	9.3E-10
BOYD2.RSA	4.8E-07	5.0E-07	4.6E-07	6.9E-07
BRAINPC2.rsa	9.0E-12	1.2E-11	8.0E-12	1.2E-11
BRATU3D.RSA	—	—	—	—
c-55.RSA	1.1E-10	3.1E-10	3.7E-11	5.4E-11
c-58.RSA	1.7E-10	4.4E-10	2.2E-10	1.5E-09
c-59.RSA	1.7E-09	1.7E-09	8.3E-10	2.3E-09
c-62.RSA	5.0E-10	8.8E-10	7.0E-10	4.1E-10
c-63.RSA	2.1E-10	5.8E-10	2.2E-10	3.8E-10
c-68.RSA	2.9E-13	4.6E-13	5.2E-14	6.3E-14
c-69.RSA	6.7E-11	7.2E-11	4.9E-11	6.3E-11
c-70.RSA	1.0E-10	7.6E-11	5.2E-11	8.6E-11
c-71.RSA	9.6E-10	1.7E-09	5.6E-10	2.6E-09
c-72.RSA	4.5E-11	1.0E-09	3.9E-11	4.4E-11
CONT-201.RSA	—	—	—	8.9E-14
CONT-300.RSA	—	—	—	1.1E-13
copter2.rsa	8.0E-11	4.9E-11	5.5E-11	2.6E-11
crystk02.RSA	4.9E-15	3.4E-15	2.1E-15	3.3E-15

Table 3.2.4.12: Norm of scaled residuals (continued)

Name	MA27	MA47	MA57	MA67
crystk03.RSA	6.6E-15	4.5E-15	2.7E-15	4.1E-15
DARCY003.rsa	8.0E-15	2.8E-15	1.9E-15	3.4E-15
dawson5.rsa	5.5E-12	1.2E-11	1.3E-11	1.3E-11
DIXMAANL.rsa	2.2E-15	3.5E-14	2.9E-14	1.1E-15
DTOC.mat	2.8E-13	6.3E-15	–	2.7E-13
D_PRETOK.rsa	2.7E-15	1.2E-14	2.5E-15	7.3E-14
HELM2D03.rsa	4.0E-11	4.3E-12	3.7E-12	3.2E-12
HELM3D01.rsa	2.0E-11	1.3E-11	2.8E-12	3.8E-12
K1_SAN.rsa	7.6E-14	1.0E-14	4.0E-15	1.4E-14
LINVERSE.rsa	1.8E-16	1.7E-16	9.5E-16	7.4E-16
mario001.rsa	5.8E-15	1.9E-15	1.1E-15	2.1E-15
mario002.rsa	8.0E-15	2.8E-15	1.9E-15	3.4E-15
NCVXBQP1.rsa	1.5E-12	1.5E-12	1.1E-13	2.6E-13
NCVXQP1.mat	1.4E-14	1.0E-13	1.1E-14	3.2E-14
NCVXQP3.rsa	7.8E-07	–	4.8E-08	–
NCVXQP5.rsa	1.3E-09	6.4E-10	1.2E-09	1.4E-09
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	3.6E-18	4.6E-14	1.9E-16	5.7E-13
olesnik0.rsa	1.2E-13	1.4E-14	5.5E-15	1.5E-14
qa8fk.RSA	1.6E-13	5.8E-14	2.6E-14	5.8E-14
SIT100.rsa	2.6E-15	2.1E-15	4.8E-15	3.6E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	3.2E-14	4.9E-14	8.4E-14	2.2E-14
stokes128.mat	4.4E-13	3.5E-13	1.0E-12	1.4E-12
stokes64.mat	2.6E-13	2.8E-14	1.3E-13	7.4E-13
stokes64s.mat	1.7E-14	7.2E-15	7.3E-15	8.9E-14
tuma1.mat	3.8E-15	1.9E-15	1.6E-14	2.7E-14
tuma2.mat	4.3E-15	2.7E-15	1.2E-14	2.4E-14
TURON_M.rsa	4.1E-14	2.8E-14	4.4E-15	2.8E-14
vibrobox.RSA	5.5E-16	2.8E-16	2.9E-16	4.9E-16

Table 3.2.4.13: Norm of scaled residuals following a single refinement

Name	MA27	MA47	MA57	MA67
A0NSDSIL.rsa	1.2E-16	1.4E-16	5.9E-17	9.5E-17
A2NNSNSL.rsa	3.7E-17	4.2E-17	5.6E-17	3.3E-17
A5ESINDL.rsa	4.8E-17	1.1E-16	1.2E-16	4.7E-17
AUG2D.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG2DC.mat	0.0E+00	0.0E+00	–	0.0E+00
AUG3D.mat	0.0E+00	0.0E+00	0.0E+00	0.0E+00
AUG3DCQP.mat	5.1E-17	5.2E-17	5.4E-17	4.6E-17
bcsstk35.RSA	8.4E-16	5.9E-16	1.1E-16	2.4E-16
bcsstk37.RSA	9.3E-16	9.4E-16	9.5E-16	9.5E-16
bcsstk39.RSA	2.3E-16	2.2E-16	2.1E-16	2.2E-16
BLOCKQP1.rsa	2.4E-15	4.8E-14	4.9E-14	7.1E-14
BLOWEYA.rsa	1.8E-13	6.1E-14	1.8E-13	1.8E-13
bmw3_2.rsa	2.8E-16	2.9E-16	2.3E-16	2.6E-16

Table 3.2.4.13: Norm of scaled residuals following a single refinement (continued)

Name	MA27	MA47	MA57	MA67
BOYD1.RSA	2.7E-15	1.3E-14	4.9E-16	8.2E-15
BOYD2.RSA	1.7E-15	2.2E-15	2.1E-15	2.3E-15
BRAINPC2.rsa	6.6E-15	6.4E-15	6.6E-15	6.4E-15
BRATU3D.RSA	—	—	—	—
c-55.RSA	6.3E-16	6.1E-16	6.5E-16	6.6E-16
c-58.RSA	3.0E-15	2.3E-15	3.2E-15	2.9E-15
c-59.RSA	7.6E-15	3.3E-15	9.1E-15	2.8E-15
c-62.RSA	6.3E-15	1.5E-15	1.6E-15	1.9E-15
c-63.RSA	1.2E-15	9.1E-16	1.3E-16	1.1E-15
c-68.RSA	5.9E-17	1.2E-17	5.9E-17	1.2E-17
c-69.RSA	6.9E-17	6.7E-17	7.0E-17	1.6E-16
c-70.RSA	3.4E-16	3.0E-16	2.9E-16	2.8E-16
c-71.RSA	5.7E-15	2.0E-14	1.9E-15	2.3E-14
c-72.RSA	1.3E-15	1.4E-14	1.4E-15	1.1E-15
CONT-201.RSA	—	—	—	2.4E-15
CONT-300.RSA	—	—	—	2.6E-15
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.5E-15	1.5E-15	1.4E-15	1.5E-15
crystk03.RSA	1.9E-15	1.8E-15	1.8E-15	1.8E-15
DARCY003.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
dawson5.rsa	2.3E-16	2.3E-16	2.3E-16	2.3E-16
DIXMAANL.rsa	9.6E-17	1.0E-16	1.0E-16	9.7E-17
DTOC.mat	2.4E-13	3.5E-15	—	2.3E-13
D_PRETOK.rsa	1.1E-16	1.1E-16	9.8E-17	1.2E-16
HELM2D03.rsa	3.9E-15	3.9E-15	3.9E-15	3.9E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.2E-16	1.2E-16	1.1E-16	1.2E-16
LINVERSE.rsa	9.5E-17	9.3E-17	9.4E-17	9.6E-17
mario001.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
mario002.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.1E-16	1.2E-16	1.3E-16	1.4E-16
NCVXQP3.rsa	6.5E-13	—	1.1E-14	—
NCVXQP5.rsa	1.5E-16	1.4E-16	3.4E-16	1.4E-16
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.3E-23	3.0E-24	1.3E-23	9.0E-21
olesnik0.rsa	1.2E-15	1.0E-16	8.7E-17	9.3E-17
qa8fk.RSA	1.6E-13	2.0E-14	1.0E-14	5.0E-14
SIT100.rsa	2.9E-16	3.3E-16	5.0E-16	3.3E-16
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	1.3E-16	1.4E-16	1.3E-16	1.4E-16
stokes128.mat	3.9E-13	4.1E-13	2.5E-12	5.5E-13
stokes64.mat	1.8E-13	2.3E-14	6.5E-13	3.9E-12
stokes64s.mat	1.2E-14	8.1E-15	5.9E-15	1.2E-13
tuma1.mat	9.5E-17	9.3E-17	9.5E-17	9.3E-17
tuma2.mat	9.8E-17	9.5E-17	9.6E-17	9.6E-17
TURON_M.rsa	4.6E-15	3.3E-16	1.8E-16	4.1E-16
vibrobox.RSA	7.9E-16	1.3E-16	1.2E-16	1.2E-16

3.3 MA57 option comparisons

As in the positive-definite case, it should be apparent from the results given in Section 2.2 that MA57 frequently significantly outperforms its competitors, at least in terms of the CPU time required. In this section, we report on further experiments which aim to further improve this code by replacing the default Approximate Minimum Degree (AMD) ordering (Amestoy et al., 1996) identified in MA57 analysis phase with one of 3 further alternatives suggested in Section 2.3.

To remind the reader, the first possibility is to use instead the multi-level graph partitioning ordering generated by the METIS package (Karypis and Kumar, 1999). We denote this option MA57_METIS. Secondly we consider the minimum degree ordering as found by the analysis phase of MA27 (MA57_MA27). Finally, we have tried a special version (soon to be released in HSL as MC50) of the AMD ordering, in which precautions are taken to ensure that (close to) dense rows do not dominate the search for the approximate minimum degree (MA57_MC50).

The statistics reported in the following tables are as described in the introduction to Section 3.2.

3.3.1 Default runs

Here are the results obtained with the (solver-dependent) default threshold pivoting parameter.

Table 3.3.1.1: Return code

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	-99	6	6	-99
AUG2DC.mat	-99	6	6	-99
AUG3D.mat	6	-2	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	-99	0	-99	-99
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	-99	-99	-2	-99
BOYD2.RSA	-99	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	0	0	0	0
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	0
c-72.RSA	0	0	0	0
CONT-201.RSA	0	0	0	0
CONT-300.RSA	0	0	0	0
copter2.rsa	0	0	0	0

Table 3.3.1.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	6	-99	-99
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	6	6	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	0	0	0
NCVXQP3.rsa	-2	-99	-99	-99
NCVXQP5.rsa	-99	-99	-99	-99
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-99	-2	-2
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0
vibrobox.RSA	0	0	0	0

Table 3.3.1.2: Total time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.561	2.927	0.470	0.583
A2NNSNSL.rsa	11.474	2.786	0.482	0.657
A5ESINDL.rsa	4.520	1.940	0.296	0.368
AUG2D.mat	–	3022.292	302.435	–
AUG2DC.mat	–	3540.330	464.931	–
AUG3D.mat	1012.311	–	9784.353	995.130
AUG3DCQP.mat	1.310	14.149	8.690	1.305
bcsstk35.RSA	2.238	3.181	2.425	2.260
bcsstk37.RSA	2.638	4.431	3.620	2.706
bcsstk39.RSA	6.419	8.597	8.588	6.385
BLOCKQP1.rsa	27.795	12.951	0.578	0.994
BLOWEYA.rsa	–	6766.076	–	–

Table 3.3.1.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bmw3_2.rsa	136.146	101.275	198.637	147.275
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	607.726	441.066	440.108
BRAINPC2.rsa	1.189	0.621	0.183	0.199
BRATU3D.RSA	157.778	235.291	224.230	156.663
c-55.RSA	20.976	164.204	533.350	47.832
c-58.RSA	20.180	163.160	142.313	43.750
c-59.RSA	16.787	200.163	222.468	221.990
c-62.RSA	61.112	535.971	1764.914	122.730
c-63.RSA	6.044	48.809	81.140	20.299
c-68.RSA	72.258	477.796	908.393	450.291
c-69.RSA	5.266	51.089	68.990	9.280
c-70.RSA	16.129	168.218	244.063	25.993
c-71.RSA	167.395	1406.130	4623.689	323.256
c-72.RSA	8.625	61.770	95.007	21.940
CONT-201.RSA	18.770	14.121	27.170	18.818
CONT-300.RSA	76.302	51.472	104.916	76.635
copter2.rsa	31.863	23.566	48.675	31.993
crystk02.RSA	12.017	6.139	10.776	12.046
crystk03.RSA	24.561	16.448	38.542	24.571
DARCY003.rsa	7.411	18.555	7.105	7.876
dawson5.rsa	4.669	6.104	5.579	4.719
DIXMAANL.rsa	0.501	1.391	0.356	0.503
DTOC.mat	–	20.965	–	–
D_PRETOK.rsa	46.652	23.642	83.341	46.599
HELM2D03.rsa	39.054	31.373	46.400	39.240
HELM3D01.rsa	20.162	14.013	29.284	20.185
K1_SAN.rsa	4.044	4.643	8.821	4.075
LINVERSE.rsa	0.061	0.220	0.050	0.063
mario001.rsa	0.443	1.293	0.422	0.466
mario002.rsa	7.414	18.580	7.136	7.752
NCVXBQP1.rsa	9.284	4.300	13.496	9.346
NCVXQP1.mat	225.327	726.744	3225.196	226.102
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1.068	1.285	3.588	1.088
olesnik0.rsa	6.278	6.520	10.806	6.357
qa8fk.RSA	181.062	48.886	235.709	182.267
SIT100.rsa	1.214	0.518	0.697	1.210
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.160	0.442	0.142	0.165
stokes128.mat	4.382	6.874	7.034	4.390
stokes64.mat	0.362	0.787	0.484	0.365
stokes64s.mat	0.595	1.068	0.778	0.601
tuma1.mat	0.427	0.814	0.584	0.427
tuma2.mat	0.167	0.385	0.224	0.168
TURON_M.rsa	41.144	23.366	72.485	43.411

Table 3.3.1.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
vibrobox.RSA	3.634	4.907	5.907	3.668

Table 3.3.1.3: Analyse time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.252	2.630	0.160	0.265
A2NNSNSL.rsa	11.174	2.498	0.181	0.346
A5ESINDL.rsa	4.311	1.755	0.108	0.172
AUG2D.mat	—	0.702	0.046	—
AUG2DC.mat	—	0.723	0.045	—
AUG3D.mat	0.080	—	0.054	0.087
AUG3DCQP.mat	0.137	1.314	0.096	0.139
bcsstk35.RSA	0.328	0.793	0.373	0.346
bcsstk37.RSA	0.256	0.795	0.303	0.277
bcsstk39.RSA	0.514	1.240	0.722	0.525
BLOCKQP1.rsa	27.490	12.397	0.183	0.490
BLOWEYA.rsa	—	0.661	—	—
bmw3_2.rsa	2.795	8.851	4.489	2.921
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	170.704	0.982	4.473
BRAINPC2.rsa	1.069	0.455	0.049	0.086
BRATU3D.RSA	0.200	1.277	0.418	0.224
c-55.RSA	0.376	2.029	0.331	0.837
c-58.RSA	0.670	2.189	0.222	0.770
c-59.RSA	0.452	2.582	0.267	1.162
c-62.RSA	0.685	2.819	0.695	1.252
c-63.RSA	0.379	2.380	0.225	0.629
c-68.RSA	0.756	3.725	0.503	2.522
c-69.RSA	0.575	3.822	0.311	0.701
c-70.RSA	0.616	3.891	0.404	0.788
c-71.RSA	1.138	5.348	1.434	2.123
c-72.RSA	0.795	4.396	0.402	0.949
CONT-201.RSA	0.363	2.602	0.325	0.411
CONT-300.RSA	0.911	6.549	0.920	1.043
copter2.rsa	0.794	3.539	1.192	0.848
crystk02.RSA	0.200	0.703	0.360	0.209
crystk03.RSA	0.418	1.418	0.928	0.426
DARCY003.rsa	2.625	14.753	1.484	3.046
dawson5.rsa	0.467	3.112	0.415	0.507
DIXMAANL.rsa	0.240	1.127	0.116	0.243
DTOC.mat	0.045	0.321	—	—
D_PRETOK.rsa	1.025	9.327	2.345	1.097
HELM2D03.rsa	3.218	15.606	3.031	3.484
HELM3D01.rsa	0.440	1.904	0.558	0.512
K1_SAN.rsa	0.322	2.821	0.468	0.349
LINVERSE.rsa	0.031	0.177	0.020	0.031
mario001.rsa	0.148	1.019	0.091	0.168

Table 3.3.1.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
mario002.rsa	2.633	14.777	1.514	2.952
NCVXBQP1.rsa	0.466	1.739	0.585	0.528
NCVXQP1.mat	0.151	0.479	0.132	0.162
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	0.062	0.388	0.035	0.075
olesnik0.rsa	0.478	3.832	0.595	0.531
qa8fk.RSA	1.054	6.152	3.170	1.175
SIT100.rsa	0.044	0.319	0.051	0.048
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.070	0.315	0.059	0.079
stokes128.mat	0.258	2.160	0.262	0.264
stokes64.mat	0.052	0.425	0.048	0.055
stokes64s.mat	0.049	0.430	0.048	0.055
tuma1.mat	0.070	0.560	0.062	0.079
tuma2.mat	0.042	0.274	0.031	0.043
TURON_M.rsa	1.085	10.140	2.455	1.312
vibrobox.RSA	0.181	0.912	0.160	0.202

Table 3.3.1.4: Factorize time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	0.271	0.254	0.272	0.279
A2NNSNSL.rsa	0.261	0.248	0.264	0.271
A5ESINDL.rsa	0.184	0.159	0.161	0.173
AUG2D.mat	—	3021.409	302.216	—
AUG2DC.mat	—	3539.424	464.683	—
AUG3D.mat	1011.736	—	9783.660	994.550
AUG3DCQP.mat	1.136	12.790	8.552	1.130
bcsstk35.RSA	1.805	2.281	1.945	1.819
bcsstk37.RSA	2.277	3.522	3.205	2.320
bcsstk39.RSA	5.684	7.107	7.613	5.638
BLOCKQP1.rsa	0.276	0.514	0.364	0.467
BLOWEYA.rsa	—	6764.591	—	—
bmw3_2.rsa	131.869	91.086	192.499	141.947
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	435.620	438.684	434.218
BRAINPC2.rsa	0.109	0.152	0.122	0.102
BRATU3D.RSA	157.183	233.657	223.345	156.052
c-55.RSA	20.474	162.061	532.836	46.827
c-58.RSA	19.433	160.867	142.001	42.890
c-59.RSA	16.239	197.448	222.065	220.660
c-62.RSA	60.101	532.923	1763.806	121.121
c-63.RSA	5.562	46.341	80.811	19.560
c-68.RSA	71.301	473.822	907.632	447.526
c-69.RSA	4.593	47.157	68.561	8.463

Table 3.3.1.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
c-70.RSA	15.370	164.185	243.488	25.028
c-71.RSA	165.762	1400.330	4621.278	320.498
c-72.RSA	7.706	57.248	94.462	20.851
CONT-201.RSA	18.117	11.284	26.517	18.117
CONT-300.RSA	74.619	44.314	103.137	74.818
copter2.rsa	30.706	19.746	47.033	30.776
crystk02.RSA	11.674	5.332	10.276	11.694
crystk03.RSA	23.859	14.799	37.262	23.859
DARCY003.rsa	4.406	3.439	5.225	4.447
dawson5.rsa	4.057	2.861	5.006	4.067
DIXMAANL.rsa	0.228	0.228	0.211	0.229
DTOC.mat	–	20.626	–	–
D_PRETOK.rsa	44.928	13.868	80.097	44.808
HELM2D03.rsa	34.846	15.029	42.335	34.809
HELM3D01.rsa	19.531	11.958	28.504	19.481
K1_SAN.rsa	3.580	1.713	8.158	3.583
LINVERSE.rsa	0.027	0.038	0.026	0.028
mario001.rsa	0.269	0.249	0.305	0.273
mario002.rsa	4.399	3.436	5.224	4.420
NCVXBQP1.rsa	8.688	2.472	12.748	8.689
NCVXQP1.mat	224.791	725.985	3224.489	225.554
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.987	0.883	3.531	0.994
olesnik0.rsa	5.602	2.538	9.962	5.631
qa8fk.RSA	179.027	42.176	231.334	180.114
SIT100.rsa	1.137	0.189	0.623	1.133
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.079	0.109	0.072	0.076
stokes128.mat	3.989	4.572	6.610	3.990
stokes64.mat	0.293	0.342	0.415	0.294
stokes64s.mat	0.523	0.612	0.703	0.522
tuma1.mat	0.337	0.236	0.497	0.329
tuma2.mat	0.118	0.103	0.184	0.118
TURON_M.rsa	39.397	12.743	69.002	41.271
vibrobox.RSA	3.392	3.932	5.673	3.404

Table 3.3.1.5: Solution time given factors (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0.038	0.043	0.038	0.038
A2NNSNSL.rsa	0.039	0.041	0.038	0.039
A5ESINDL.rsa	0.024	0.026	0.026	0.023
AUG2D.mat	–	0.181	0.173	–
AUG2DC.mat	–	0.183	0.203	–
AUG3D.mat	0.495	–	0.639	0.493

Table 3.3.1.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
AUG3DCQP.mat	0.037	0.046	0.043	0.036
bcsstk35.RSA	0.105	0.106	0.107	0.096
bcsstk37.RSA	0.105	0.113	0.112	0.109
bcsstk39.RSA	0.221	0.250	0.253	0.222
BLOCKQP1.rsa	0.028	0.039	0.031	0.037
BLOWEYA.rsa	–	0.825	–	–
bmw3_2.rsa	1.482	1.337	1.648	2.408
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	1.401	1.401	1.416
BRAINPC2.rsa	0.011	0.014	0.013	0.011
BRATU3D.RSA	0.395	0.357	0.468	0.386
c-55.RSA	0.127	0.114	0.182	0.168
c-58.RSA	0.077	0.103	0.091	0.090
c-59.RSA	0.097	0.133	0.136	0.168
c-62.RSA	0.313	0.229	0.414	0.357
c-63.RSA	0.103	0.087	0.103	0.110
c-68.RSA	0.201	0.249	0.259	0.243
c-69.RSA	0.099	0.109	0.117	0.116
c-70.RSA	0.143	0.143	0.172	0.178
c-71.RSA	0.493	0.453	0.977	0.635
c-72.RSA	0.124	0.126	0.142	0.141
CONT-201.RSA	0.290	0.235	0.328	0.290
CONT-300.RSA	0.772	0.609	0.859	0.773
copter2.rsa	0.363	0.281	0.450	0.369
crystk02.RSA	0.143	0.104	0.140	0.142
crystk03.RSA	0.284	0.230	0.352	0.286
DARCY003.rsa	0.380	0.362	0.396	0.384
dawson5.rsa	0.145	0.131	0.158	0.145
DIXMAANL.rsa	0.032	0.035	0.029	0.030
DTOC.mat	1.109	0.019	–	–
D_PRETOK.rsa	0.699	0.447	0.898	0.694
HELM2D03.rsa	0.990	0.737	1.034	0.947
HELM3D01.rsa	0.191	0.151	0.222	0.191
K1_SAN.rsa	0.142	0.109	0.194	0.142
LINVERSE.rsa	0.003	0.005	0.003	0.004
mario001.rsa	0.025	0.025	0.026	0.024
mario002.rsa	0.378	0.367	0.398	0.380
NCVXBQP1.rsa	0.130	0.089	0.164	0.129
NCVXQP1.mat	0.385	0.280	0.575	0.386
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.019	0.014	0.021	0.020
olesnik0.rsa	0.197	0.150	0.249	0.195
qa8fk.RSA	0.981	0.558	1.204	0.978
SIT100.rsa	0.033	0.010	0.023	0.029
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.011	0.018	0.012	0.010

Table 3.3.1.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
stokes128.mat	0.136	0.142	0.162	0.137
stokes64.mat	0.018	0.020	0.021	0.017
stokes64s.mat	0.023	0.025	0.027	0.024
tuma1.mat	0.020	0.018	0.024	0.020
tuma2.mat	0.007	0.007	0.008	0.007
TURON_M.rsa	0.662	0.484	1.028	0.829
vibrobox.RSA	0.061	0.063	0.074	0.061

Table 3.3.1.6: Minimum memory required (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	1.4E+01	1.4E+01	1.4E+01	1.4E+01
A2NNSNSL.rsa	1.3E+01	1.4E+01	1.4E+01	1.4E+01
A5ESINDL.rsa	9.3E+00	9.5E+00	9.4E+00	9.6E+00
AUG2D.mat	—	1.6E+03	1.6E+03	—
AUG2DC.mat	—	1.7E+03	1.8E+03	—
AUG3D.mat	2.6E+03	—	2.9E+03	2.6E+03
AUG3DCQP.mat	1.9E+01	1.9E+01	1.9E+01	1.9E+01
bcsstk35.RSA	4.6E+01	4.8E+01	4.7E+01	4.6E+01
bcsstk37.RSA	4.5E+01	4.9E+01	5.0E+01	4.5E+01
bcsstk39.RSA	8.9E+01	9.6E+01	9.9E+01	8.9E+01
BLOCKQP1.rsa	1.6E+01	3.0E+01	2.7E+01	2.7E+01
BLOWEYA.rsa	—	1.5E+03	—	—
bmw3_2.rsa	7.4E+02	6.0E+02	7.9E+02	7.4E+02
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	1.1E+03	9.6E+02	1.1E+03
BRAINPC2.rsa	5.9E+00	6.5E+00	5.8E+00	5.9E+00
BRATU3D.RSA	2.9E+02	1.4E+02	3.3E+02	2.9E+02
c-55.RSA	1.3E+02	5.3E+01	1.1E+02	1.7E+02
c-58.RSA	9.9E+01	5.7E+01	8.1E+01	1.1E+02
c-59.RSA	9.1E+01	6.8E+01	7.8E+01	1.1E+02
c-62.RSA	2.1E+02	9.9E+01	2.1E+02	3.5E+02
c-63.RSA	4.7E+01	3.8E+01	4.9E+01	5.6E+01
c-68.RSA	2.5E+02	9.2E+01	1.6E+02	2.4E+02
c-69.RSA	4.6E+01	4.6E+01	5.6E+01	5.7E+01
c-70.RSA	1.1E+02	6.7E+01	9.1E+01	1.4E+02
c-71.RSA	4.9E+02	1.9E+02	4.3E+02	8.8E+02
c-72.RSA	6.6E+01	5.0E+01	6.8E+01	9.3E+01
CONT-201.RSA	1.1E+02	8.0E+01	1.2E+02	1.1E+02
CONT-300.RSA	3.1E+02	2.0E+02	3.2E+02	3.1E+02
copter2.rsa	1.6E+02	1.1E+02	2.0E+02	1.6E+02
crystk02.RSA	8.5E+01	5.4E+01	7.5E+01	8.5E+01
crystk03.RSA	1.5E+02	1.2E+02	1.8E+02	1.5E+02
DARCY003.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
dawson5.rsa	6.3E+01	5.3E+01	6.6E+01	6.3E+01
DIXMAANL.rsa	1.2E+01	1.2E+01	1.1E+01	1.2E+01
DTOC.mat	8.5E+02	3.6E+02	—	—

Table 3.3.1.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
D_PRETOK.rsa	2.9E+02	1.6E+02	3.7E+02	2.9E+02
HELM2D03.rsa	3.3E+02	2.3E+02	3.6E+02	3.3E+02
HELM3D01.rsa	1.2E+02	6.4E+01	1.1E+02	1.2E+02
K1_SAN.rsa	5.2E+01	3.7E+01	7.6E+01	5.2E+01
LINVERSE.rsa	2.7E+00	2.9E+00	2.7E+00	2.7E+00
mario001.rsa	9.6E+00	9.5E+00	1.0E+01	9.6E+00
mario002.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
NCVXBQP1.rsa	7.5E+01	3.1E+01	8.4E+01	7.5E+01
NCVXQP1.mat	5.4E+02	2.5E+02	5.7E+02	5.4E+02
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.2E+01	5.4E+00	1.3E+01	1.2E+01
olesnik0.rsa	7.5E+01	5.1E+01	9.6E+01	7.5E+01
qa8fk.RSA	4.7E+02	2.3E+02	5.4E+02	4.7E+02
SIT100.rsa	1.5E+01	4.9E+00	1.0E+01	1.5E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLs.rsa	6.0E+00	6.8E+00	6.0E+00	6.0E+00
stokes128.mat	4.9E+01	5.0E+01	6.2E+01	4.9E+01
stokes64.mat	8.2E+00	8.3E+00	9.6E+00	8.2E+00
stokes64s.mat	9.9E+00	1.0E+01	1.1E+01	9.9E+00
tuma1.mat	8.7E+00	7.5E+00	1.1E+01	8.7E+00
tuma2.mat	4.0E+00	3.8E+00	5.1E+00	4.0E+00
TURON_M.rsa	2.6E+02	1.5E+02	3.3E+02	2.6E+02
vibrobox.RSA	3.7E+01	3.4E+01	4.9E+01	3.7E+01

Table 3.3.1.7: Actual memory used (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.7E+01	2.3E+01	1.8E+01	1.8E+01
A2NNSNSL.rsa	1.6E+01	2.3E+01	1.8E+01	1.7E+01
A5ESINDL.rsa	1.2E+01	1.6E+01	1.1E+01	1.2E+01
AUG2D.mat	—	2.3E+03	2.5E+03	—
AUG2DC.mat	—	2.2E+03	2.3E+03	—
AUG3D.mat	3.1E+03	—	3.4E+03	3.1E+03
AUG3DCQP.mat	2.1E+01	2.3E+01	2.1E+01	2.1E+01
bcsstk35.RSA	5.4E+01	5.8E+01	5.4E+01	5.4E+01
bcsstk37.RSA	5.1E+01	5.7E+01	5.3E+01	5.1E+01
bcsstk39.RSA	1.0E+02	1.1E+02	1.1E+02	1.0E+02
BLOCKQP1.rsa	2.0E+01	3.8E+01	3.2E+01	3.2E+01
BLOWEYA.rsa	—	1.5E+03	—	—
bmw3.2.rsa	8.1E+02	6.7E+02	8.5E+02	8.1E+02
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	1.1E+03	9.7E+02	1.1E+03
BRAINPC2.rsa	6.8E+00	9.7E+00	7.5E+00	6.9E+00
BRATU3D.RSA	3.0E+02	1.4E+02	3.5E+02	3.0E+02
c-55.RSA	1.7E+02	6.1E+01	1.2E+02	1.7E+02

Table 3.3.1.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
c-58.RSA	1.0E+02	6.3E+01	9.0E+01	1.2E+02
c-59.RSA	9.5E+01	7.3E+01	8.2E+01	1.2E+02
c-62.RSA	2.2E+02	1.1E+02	2.2E+02	3.6E+02
c-63.RSA	5.0E+01	4.2E+01	5.3E+01	6.0E+01
c-68.RSA	3.0E+02	1.1E+02	1.7E+02	3.3E+02
c-69.RSA	5.0E+01	5.3E+01	6.4E+01	6.2E+01
c-70.RSA	1.1E+02	7.9E+01	9.7E+01	1.5E+02
c-71.RSA	5.1E+02	2.1E+02	4.7E+02	9.1E+02
c-72.RSA	7.2E+01	5.9E+01	7.6E+01	9.9E+01
CONT-201.RSA	1.2E+02	9.0E+01	1.3E+02	1.2E+02
CONT-300.RSA	3.3E+02	2.3E+02	3.4E+02	3.3E+02
copter2.rsa	1.8E+02	1.2E+02	2.1E+02	1.8E+02
crystk02.RSA	9.7E+01	6.1E+01	8.0E+01	9.7E+01
crystk03.RSA	1.7E+02	1.3E+02	2.0E+02	1.7E+02
DARCY003.rsa	1.2E+02	1.3E+02	1.4E+02	1.3E+02
dawson5.rsa	7.1E+01	6.1E+01	7.4E+01	7.2E+01
DIXMAANL.rsa	1.4E+01	1.8E+01	1.5E+01	1.4E+01
DTOC.mat	9.6E+02	4.1E+02	—	—
D_PRETOK.rsa	3.1E+02	1.8E+02	3.8E+02	3.1E+02
HELM2D03.rsa	3.6E+02	2.6E+02	3.8E+02	3.6E+02
HELM3D01.rsa	1.3E+02	7.2E+01	1.2E+02	1.3E+02
K1_SAN.rsa	5.7E+01	4.3E+01	8.2E+01	5.8E+01
LINVERSE.rsa	3.2E+00	4.8E+00	3.0E+00	3.3E+00
mario001.rsa	1.1E+01	1.3E+01	1.2E+01	1.1E+01
mario002.rsa	1.2E+02	1.3E+02	1.4E+02	1.3E+02
NCVXBQP1.rsa	7.9E+01	4.2E+01	8.9E+01	8.0E+01
NCVXQP1.mat	6.5E+02	3.4E+02	6.2E+02	6.5E+02
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.4E+01	6.3E+00	1.6E+01	1.4E+01
olesnik0.rsa	8.3E+01	5.8E+01	1.0E+02	8.3E+01
qa8fk.RSA	5.3E+02	2.6E+02	5.9E+02	5.3E+02
SIT100.rsa	1.8E+01	6.0E+00	1.1E+01	1.8E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	7.1E+00	1.0E+01	7.1E+00	7.3E+00
stokes128.mat	5.5E+01	5.6E+01	6.9E+01	5.5E+01
stokes64.mat	9.8E+00	1.1E+01	1.1E+01	9.8E+00
stokes64s.mat	1.1E+01	1.2E+01	1.3E+01	1.1E+01
tuma1.mat	9.8E+00	9.1E+00	1.2E+01	9.9E+00
tuma2.mat	4.7E+00	4.9E+00	6.1E+00	4.7E+00
TURON_M.rsa	2.9E+02	1.7E+02	3.6E+02	2.9E+02
vibrobox.RSA	3.8E+01	3.8E+01	5.0E+01	3.8E+01

Table 3.3.1.8: Number of integers used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	504335	488083	500031	509978

Table 3.3.1.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A2NNSNSL.rsa	479341	483040	476586	496262
A5ESINDL.rsa	350816	314922	334636	344984
AUG2D.mat	–	1696654	350480	–
AUG2DC.mat	–	1864732	383853	–
AUG3D.mat	319170	–	2684432	319170
AUG3DCQP.mat	237346	912924	499057	237346
bcsstk35.RSA	227325	257692	230730	227325
bcsstk37.RSA	205511	243649	210860	205511
bcsstk39.RSA	395732	444080	410448	395732
BLOCKQP1.rsa	399890	320025	400023	400020
BLOWEYA.rsa	–	296568	–	–
bmw3.2.rsa	2090696	2397644	2210793	2090696
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	2040470	2040490	2040510
BRAINPC2.rsa	83077	134506	145255	83124
BRATU3D.RSA	397474	1580671	423313	397474
c-55.RSA	428362	2261837	3309894	643997
c-58.RSA	569919	1973220	1591328	861628
c-59.RSA	495022	2225810	2036097	1757727
c-62.RSA	596276	4408734	7027297	847875
c-63.RSA	422720	1428697	1435198	752976
c-68.RSA	754355	3665198	4114110	1999252
c-69.RSA	589952	1778592	1754867	673369
c-70.RSA	634941	2376458	2555433	755198
c-71.RSA	1024174	7829721	11899741	1251032
c-72.RSA	725965	1955273	1975724	922250
CONT-201.RSA	644445	851134	676124	644445
CONT-300.RSA	1472588	1962736	1547345	1472588
copter2.rsa	837861	979623	879585	837861
crystk02.RSA	173257	183323	182530	173257
crystk03.RSA	317983	348973	330965	317983
DARCY003.rsa	1937373	2005536	1962272	1937373
dawson5.rsa	561998	615037	580033	561998
DIXMAANL.rsa	459063	481135	389957	459063
DTOC.mat	–	191815	–	–
D_PRETOK.rsa	1310111	1326555	1357664	1310111
HELM2D03.rsa	3744078	3897412	3825244	3744078
HELM3D01.rsa	480955	611305	556436	480955
K1_SAN.rsa	442161	447547	469228	442161
LINVERSE.rsa	41989	59811	41995	41989
mario001.rsa	186966	193916	189652	186966
mario002.rsa	1937373	2005536	1962272	1937373
NCVXBQP1.rsa	516541	517809	533527	516541
NCVXQP1.mat	293966	1046366	1575512	293966
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	100104	124202	126075	100104

Table 3.3.1.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
olesnik0.rsa	581867	588492	615139	581867
qa8fk.RSA	1861292	1119350	1556234	1861292
SIT100.rsa	79632	67610	77735	79632
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129892	150711	129831	129892
stokes128.mat	344595	454822	359253	344595
stokes64.mat	78983	102800	81607	78983
stokes64s.mat	84083	112010	87190	84083
tuma1.mat	122997	127076	127748	122997
tuma2.mat	67108	70505	70326	67108
TURON_M.rsa	1339403	1341309	1393909	1339403
vibrobox.RSA	211980	276803	215846	211980

Table 3.3.1.9: Number of reals used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	344433	349869	340032	350039
A2NNSNSL.rsa	327247	329204	324393	336405
A5ESINDL.rsa	231428	230083	215080	225007
AUG2D.mat	—	6114686	6521828	—
AUG2DC.mat	—	6191556	7704686	—
AUG3D.mat	20253212	—	18661584	20253212
AUG3DCQP.mat	958196	1034015	1003603	958196
bcsstk35.RSA	2734087	3073420	2880128	2734087
bcsstk37.RSA	2934743	3534766	3376801	2934743
bcsstk39.RSA	6688230	7536059	7852736	6688230
BLOCKQP1.rsa	380113	780068	380068	380068
BLOWEYA.rsa	—	51063748	—	—
bmw3_2.rsa	55605822	48264341	63638516	55605822
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	77368717	77375930	77368717
BRAINPC2.rsa	234334	323340	231917	245889
BRATU3D.RSA	18208464	11476751	20899472	18208464
c-55.RSA	5328923	3461421	5556353	7487008
c-58.RSA	2611332	2904610	2656425	2774554
c-59.RSA	3595058	3471185	3473714	4900354
c-62.RSA	11235017	6697773	11413522	15290152
c-63.RSA	2544000	2225792	2550781	3003672
c-68.RSA	8309760	5696973	7343627	9177699
c-69.RSA	2694692	2626416	2892976	3414961
c-70.RSA	4830380	3614700	4495814	6294688
c-71.RSA	21912782	12323532	21333468	31293983
c-72.RSA	3408205	2932645	3484762	4258543
CONT-201.RSA	10375113	7615717	12072420	10375113
CONT-300.RSA	28895511	20243716	32536708	28895511
copter2.rsa	14143112	9700813	17237332	14143112
crystk02.RSA	6098260	4185822	5852382	6098260
crystk03.RSA	11904216	9480888	14710431	11904216

Table 3.3.1.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
DARCY003.rsa	6941313	6384124	7628724	6941313
dawson5.rsa	4627722	4003216	5214325	4627722
DIXMAANL.rsa	340125	383184	350078	340125
DTOC.mat	–	490025	–	–
D_PRETOK.rsa	24794239	13870081	33713255	24794239
HELM2D03.rsa	28015811	18900741	31686835	28015811
HELM3D01.rsa	7631962	5084380	8147928	7631962
K1_SAN.rsa	4285569	2918510	6568004	4285569
LINVERSE.rsa	54019	92386	53988	54019
mario001.rsa	529699	523591	582220	529699
mario002.rsa	6941313	6384124	7628724	6941313
NCVXBQP1.rsa	4150853	2048990	5390917	4150853
NCVXQP1.mat	21836443	11320233	22826879	21836443
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	628980	365766	650861	628980
olesnik0.rsa	6063534	4095890	8428129	6063534
qa8fk.RSA	40901710	21607991	51388343	40901710
SIT100.rsa	1142476	373883	821500	1142476
SPARSINE.rsa	–	–	–	–
SPMSRTL5.rsa	130231	229326	130235	130231
stokes128.mat	4324931	4559388	5574195	4324931
stokes64.mat	615357	652547	758672	615357
stokes64s.mat	806760	862937	974730	806760
tuma1.mat	536696	444792	694664	536696
tuma2.mat	224637	210727	301978	224637
TURON_M.rsa	23280502	13002764	31265123	23280502
vibrobox.RSA	2318439	2405049	2962992	2318439

Table 3.3.1.10: Total number of integers used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	505049	533069	545036	555008
A2NNSNSL.rsa	482995	526080	519635	539340
A5ESINDL.rsa	350841	339935	359644	370001
AUG2D.mat	–	1677076	331018	–
AUG2DC.mat	–	1844348	363477	–
AUG3D.mat	296000	–	2659181	296000
AUG3DCQP.mat	239406	912957	499126	239406
bcsstk35.RSA	770442	770442	770442	770442
bcsstk37.RSA	608748	608748	608748	608748
bcsstk39.RSA	1114810	1114810	1114810	1114810
BLOCKQP1.rsa	420062	560062	640053	640053
BLOWEYA.rsa	–	306604	–	–
bmw3.2.rsa	5985363	5985363	5985363	5985363
BOYD1.RSA	–	–	–	–

Table 3.3.1.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD2.RSA	–	2227674	2273168	2278893
BRAINPC2.rsa	152074	138203	152153	152076
BRATU3D.RSA	404795	1580672	429528	404795
c-55.RSA	444074	2261852	3309930	669222
c-58.RSA	586846	1973235	1591407	881606
c-59.RSA	505343	2225848	2036169	1781539
c-62.RSA	623553	4408739	7027312	891586
c-63.RSA	427913	1428719	1435300	762642
c-68.RSA	769893	3665214	4114146	2047075
c-69.RSA	593859	1778671	1754934	685847
c-70.RSA	645741	2376474	2555531	771024
c-71.RSA	1053523	7829740	11899833	1303686
c-72.RSA	731660	1955363	1975842	934179
CONT-201.RSA	647388	852321	678706	647388
CONT-300.RSA	1477617	1964691	1551532	1477617
copter2.rsa	862482	983097	890777	862482
crystk02.RSA	505244	505244	505244	505244
crystk03.RSA	912638	912638	912638	912638
DARC003.rsa	1939303	2006678	1964020	1939303
dawson5.rsa	582864	619640	586765	582864
DIXMAANL.rsa	459088	481186	389977	459088
DTOC.mat	–	181827	–	–
D-PRETOK.rsa	1319045	1328808	1365176	1319045
HELM2D03.rsa	3752224	3901018	3831360	3752224
HELM3D01.rsa	494980	616205	561324	494980
K1_SAN.rsa	444879	448720	472729	444879
LINVERSE.rsa	71992	72008	71992	71992
mario001.rsa	187570	194278	190256	187570
mario002.rsa	1939303	2006678	1964020	1939303
NCVXBQP1.rsa	518934	520944	540574	518934
NCVXQP1.mat	306684	1049766	1578977	306684
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	101266	124348	126642	101266
olesnik0.rsa	585695	589764	618420	585695
qa8fk.RSA	1892539	1133613	1577613	1892539
SIT100.rsa	82109	68086	78973	82109
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	159976	159976	159977	159976
stokes128.mat	362008	456548	362621	362008
stokes64.mat	90904	103588	90904	90904
stokes64s.mat	90904	112847	90904	90904
tuma1.mat	124164	127725	128821	124164
tuma2.mat	67737	70876	71069	67737
TURON_M.rsa	1348714	1343739	1400014	1348714
vibrobox.RSA	224011	285250	225729	224011

Table 3.3.1.11: Total number of reals used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	450038	530197	520064	530109
A2NNSNSL.rsa	409414	493813	488994	501100
A5ESINDL.rsa	249997	280129	265165	275089
AUG2D.mat	—	201005184	203913793	—
AUG2DC.mat	—	216156560	221446339	—
AUG3D.mat	328977068	—	355690986	328977068
AUG3DCQP.mat	1726268	1455926	1576741	1726268
bcsstk35.RSA	2990750	3229106	3109304	2990750
bcsstk37.RSA	3393685	3916433	4024523	3393685
bcsstk39.RSA	7106639	8066011	8412126	7106639
BLOCKQP1.rsa	420242	2100227	1700210	1700221
BLOWEYA.rsa	—	188809247	—	—
bmw3.2.rsa	71633596	53330689	77004920	71633596
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	129394969	113467823	129721375
BRAINPC2.rsa	234620	310430	220976	234760
BRATU3D.RSA	35536699	16061984	40608029	35536699
c-55.RSA	14872578	4722973	11895869	19568783
c-58.RSA	10978067	5028545	8277216	12726970
c-59.RSA	10182405	6354038	7771203	11277843
c-62.RSA	24537188	9011252	21621653	42152811
c-63.RSA	4734398	3042497	4504640	5736023
c-68.RSA	29066279	8426905	16536458	28071968
c-69.RSA	4091738	3490270	4789509	5425030
c-70.RSA	11564616	5801995	8688432	15476951
c-71.RSA	59434116	18565813	46463347	107430803
c-72.RSA	6313905	3662244	5897359	9572013
CONT-201.RSA	12232421	8453347	13905869	12232421
CONT-300.RSA	35087658	21924060	37141587	35087658
copter2.rsa	18400990	11502732	23566097	18400990
crystk02.RSA	8827118	4946689	7553397	8827118
crystk03.RSA	15713960	11223705	19640568	15713960
DARCY003.rsa	7562066	6614318	8277800	7562066
dawson5.rsa	5754777	4411217	6161812	5754777
DIXMAANL.rsa	380038	383296	350133	380038
DTOC.mat	—	44267551	—	—
D_PRETOK.rsa	31424089	15293141	41839159	31424089
HELM2D03.rsa	32569973	20003852	35809219	32569973
HELM3D01.rsa	13763575	6810756	13105621	13763575
K1_SAN.rsa	4999323	3148799	7960256	4999323
LINVERSE.rsa	60021	92742	60021	60021
mario001.rsa	575236	548562	658749	575236
mario002.rsa	7562066	6614318	8277800	7562066
NCVXBQP1.rsa	8077213	2646237	9211093	8077213
NCVXQP1.mat	66952875	30605603	70819959	66952875
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—

Table 3.3.1.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	1301967	440041	1345974	1301967
olesnik0.rsa	7453295	4412593	9994886	7453295
qa8fk.RSA	55505819	25207355	64290070	55505819
SIT100.rsa	1694083	419390	1069194	1694083
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	130097	229339	130105	130097
stokes128.mat	4801209	4879629	6455534	4801209
stokes64.mat	689142	700444	875162	689142
stokes64s.mat	908780	931046	1104201	908780
tuma1.mat	687742	524576	939946	687742
tuma2.mat	277035	242206	413967	277035
TURON_M.rsa	28481724	14192208	36634496	28481724
vibrobox.RSA	3887771	3513085	5386653	3887771

Table 3.3.1.12: Norm of scaled residuals

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.6E-15	1.2E-15	2.5E-16	1.1E-15
A2NNSNSL.rsa	1.2E-15	1.2E-15	6.5E-16	8.1E-16
A5ESINDL.rsa	6.1E-16	9.4E-16	5.4E-16	3.5E-16
AUG2D.mat	—	0.0E+00	0.0E+00	—
AUG2DC.mat	—	0.0E+00	0.0E+00	—
AUG3D.mat	0.0E+00	—	0.0E+00	0.0E+00
AUG3DCQP.mat	1.1E-16	1.0E-16	1.1E-16	1.1E-16
bcsstk35.RSA	4.6E-16	1.2E-16	2.4E-16	4.6E-16
bcsstk37.RSA	1.2E-15	1.2E-15	1.2E-15	1.2E-15
bcsstk39.RSA	2.4E-16	2.4E-16	2.5E-16	2.4E-16
BLOCKQP1.rsa	1.2E-12	1.2E-12	1.2E-12	1.2E-12
BLOWEYA.rsa	—	3.5E-14	—	—
bmw3_2.rsa	6.6E-16	2.8E-16	1.8E-16	6.6E-16
BOYD1.RSA	—	—	—	—
BOYD2.RSA	—	1.3E-15	1.3E-15	1.8E-15
BRAINPC2.rsa	1.8E-14	1.9E-14	2.4E-14	1.9E-14
BRATU3D.RSA	9.9E-10	3.0E-10	3.9E-10	9.9E-10
c-55.RSA	4.7E-17	4.6E-17	6.4E-17	5.1E-17
c-58.RSA	4.3E-15	2.2E-15	8.7E-15	2.6E-15
c-59.RSA	9.2E-17	7.5E-16	3.3E-15	1.2E-15
c-62.RSA	5.1E-16	1.8E-15	9.2E-15	6.2E-16
c-63.RSA	6.2E-17	4.4E-17	6.1E-17	1.0E-16
c-68.RSA	5.5E-16	1.8E-16	6.2E-16	4.0E-16
c-69.RSA	1.3E-17	7.2E-18	1.8E-17	2.4E-17
c-70.RSA	1.3E-17	1.2E-17	1.5E-17	1.2E-17
c-71.RSA	1.7E-16	1.6E-16	3.3E-16	1.5E-16
c-72.RSA	5.8E-17	9.7E-17	6.5E-17	9.0E-17
CONT-201.RSA	2.4E-11	3.6E-11	4.5E-11	2.4E-11
CONT-300.RSA	2.3E-11	3.8E-11	4.0E-11	2.3E-11
copter2.rsa	1.8E-12	5.1E-13	9.2E-13	1.8E-12
crystk02.RSA	2.3E-15	2.2E-15	2.2E-15	2.3E-15

Table 3.3.1.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk03.RSA	2.8E-15	3.0E-15	2.9E-15	2.8E-15
DARCY003.rsa	1.8E-15	1.8E-15	2.1E-15	1.8E-15
dawson5.rsa	2.1E-13	1.8E-13	4.2E-13	2.1E-13
DIXMAANL.rsa	6.7E-16	5.7E-16	3.6E-16	6.7E-16
DTOC.mat	4.0E-16	4.8E-14	—	—
D_PRETOK.rsa	1.6E-15	9.5E-16	1.3E-15	1.6E-15
HELM2D03.rsa	1.1E-12	9.6E-13	1.6E-12	1.1E-12
HELM3D01.rsa	4.8E-13	2.2E-13	4.1E-13	4.8E-13
K1_SAN.rsa	4.2E-15	2.5E-15	2.0E-14	4.2E-15
LINVERSE.rsa	4.9E-16	4.4E-16	1.8E-16	4.9E-16
mario001.rsa	1.1E-15	1.0E-15	2.2E-15	1.1E-15
mario002.rsa	1.8E-15	1.8E-15	2.1E-15	1.8E-15
NCVXBQP1.rsa	2.9E-14	4.6E-15	3.2E-14	2.9E-14
NCVXQP1.mat	2.8E-16	2.3E-16	2.2E-16	2.8E-16
NCVXQP3.rsa	—	—	—	—
NCVXQP5.rsa	—	—	—	—
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.1E-16	1.1E-16	1.1E-16	1.1E-16
olesnik0.rsa	7.6E-15	1.4E-15	6.8E-15	7.6E-15
qa8fk.RSA	1.7E-14	1.2E-14	1.9E-14	1.7E-14
SIT100.rsa	2.3E-15	3.5E-15	4.0E-15	2.3E-15
SPARSINE.rsa	—	—	—	—
SPMSRTL5.rsa	2.3E-15	3.1E-15	2.2E-15	2.3E-15
stokes128.mat	1.8E-14	2.6E-14	2.4E-14	1.8E-14
stokes64.mat	7.2E-14	6.0E-14	2.7E-14	7.2E-14
stokes64s.mat	2.9E-15	2.8E-15	2.8E-15	2.9E-15
tuma1.mat	2.9E-15	2.0E-15	2.5E-15	2.9E-15
tuma2.mat	3.8E-15	1.8E-15	3.3E-15	3.8E-15
TURON_M.rsa	4.1E-15	2.0E-15	9.5E-15	4.1E-15
vibrobox.RSA	3.4E-16	3.1E-16	3.7E-16	3.4E-16

Table 3.3.1.13: Norm of scaled residuals following a single refinement

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	6.2E-17	9.3E-17	3.3E-17	5.1E-17
A2NNSNSL.rsa	4.6E-17	4.0E-17	3.5E-17	7.6E-17
A5ESINDL.rsa	8.0E-17	5.9E-17	6.1E-17	1.3E-16
AUG2D.mat	—	0.0E+00	0.0E+00	—
AUG2DC.mat	—	0.0E+00	0.0E+00	—
AUG3D.mat	0.0E+00	—	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-17	1.3E-17	1.3E-17	1.3E-17
bcsstk35.RSA	2.9E-16	5.2E-16	3.4E-16	2.9E-16
bcsstk37.RSA	9.6E-16	9.4E-16	9.7E-16	9.6E-16
bcsstk39.RSA	1.9E-16	1.9E-16	1.9E-16	1.9E-16
BLOCKQP1.rsa	4.9E-14	2.4E-15	2.4E-15	2.4E-15
BLOWEYA.rsa	—	4.6E-15	—	—
bmw3_2.rsa	1.7E-16	2.5E-16	1.4E-16	1.7E-16

Table 3.3.1.13: Norm of scaled residuals following a single refinement (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD1.RSA	–	–	–	–
BOYD2.RSA	–	1.2E-15	2.0E-15	3.5E-15
BRAINPC2.rsa	9.0E-16	7.7E-16	2.3E-15	3.1E-15
BRATU3D.RSA	1.1E-15	9.7E-16	9.4E-16	1.1E-15
c-55.RSA	5.0E-18	4.1E-18	5.2E-18	1.1E-17
c-58.RSA	1.1E-15	5.0E-16	1.5E-15	6.0E-16
c-59.RSA	3.2E-16	2.2E-17	9.0E-16	6.5E-16
c-62.RSA	3.2E-16	5.0E-16	1.8E-15	2.5E-16
c-63.RSA	6.8E-18	1.9E-17	1.1E-17	7.7E-18
c-68.RSA	3.3E-17	3.3E-17	3.3E-17	3.3E-17
c-69.RSA	5.1E-19	2.4E-18	4.2E-18	1.3E-17
c-70.RSA	4.3E-18	2.4E-18	5.1E-18	2.4E-18
c-71.RSA	7.5E-17	8.3E-17	1.1E-16	6.2E-17
c-72.RSA	1.7E-18	1.2E-17	7.8E-18	1.7E-17
CONT-201.RSA	2.1E-15	1.6E-15	2.0E-15	2.1E-15
CONT-300.RSA	2.2E-15	2.2E-15	2.2E-15	2.2E-15
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.5E-15	1.5E-15	1.5E-15	1.5E-15
crystk03.RSA	1.9E-15	1.8E-15	1.9E-15	1.9E-15
DARC003.rsa	9.3E-17	9.5E-17	9.8E-17	9.3E-17
dawson5.rsa	2.2E-16	2.3E-16	2.3E-16	2.2E-16
DIXMAANL.rsa	9.6E-17	9.6E-17	9.6E-17	9.6E-17
DTOC.mat	1.7E-15	2.1E-15	–	–
D_PRETOK.rsa	9.4E-17	9.2E-17	9.5E-17	9.4E-17
HELM2D03.rsa	3.6E-15	3.6E-15	3.6E-15	3.6E-15
HELM3D01.rsa	1.8E-16	1.9E-16	1.8E-16	1.8E-16
K1_SAN.rsa	1.1E-16	1.0E-16	1.1E-16	1.1E-16
LINVERSE.rsa	9.7E-17	9.7E-17	9.7E-17	9.7E-17
mario001.rsa	8.6E-17	9.4E-17	9.2E-17	8.6E-17
mario002.rsa	9.3E-17	9.5E-17	9.8E-17	9.3E-17
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.1E-16	1.0E-16	1.2E-16	1.1E-16
NCVXQP3.rsa	–	–	–	–
NCVXQP5.rsa	–	–	–	–
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1.3E-23	4.4E-24	7.1E-24	1.3E-23
olesnik0.rsa	9.2E-17	8.4E-17	8.7E-17	9.2E-17
qa8fk.RSA	5.4E-15	5.7E-15	6.4E-15	5.4E-15
SIT100.rsa	2.2E-16	3.7E-16	7.7E-16	2.2E-16
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
stokes128.mat	9.1E-15	1.1E-14	9.3E-15	9.1E-15
stokes64.mat	4.7E-13	2.4E-14	5.5E-15	4.7E-13
stokes64s.mat	1.5E-15	1.4E-15	1.2E-15	1.5E-15
tuma1.mat	7.5E-17	7.2E-17	7.2E-17	7.5E-17
tuma2.mat	7.2E-17	7.0E-17	7.3E-17	7.2E-17
TURON_M.rsa	1.3E-16	1.4E-16	1.4E-16	1.3E-16
vibrobox.RSA	1.2E-16	1.6E-16	1.4E-16	1.2E-16

3.3.2 Runs with small threshold pivot tolerance

Here are the results obtained with small ($u = 10^{-10}$) threshold pivoting parameter.

Table 3.3.2.1: Return code

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	-99	6	6	-99
AUG2DC.mat	-99	6	6	-99
AUG3D.mat	6	-2	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	0	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	-13	-13	-13	-13
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	0
c-72.RSA	0	0	0	0
CONT-201.RSA	-13	-13	-13	-13
CONT-300.RSA	-13	-13	-13	-13
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	6	-99	-99
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	6	6	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	0	0	0

Table 3.3.2.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP3.rsa	0	0	-99	0
NCVXQP5.rsa	0	0	0	0
NCVXQP7.rsa	-99	0	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-99	-2	-2
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	-13	0	0	-13
vibrobox.RSA	0	0	0	0

Table 3.3.2.2: Total time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	10.556	2.930	0.473	0.584
A2NNSNSL.rsa	11.447	2.778	0.480	0.671
A5ESINDL.rsa	4.501	1.933	0.292	0.385
AUG2D.mat	—	2922.600	303.230	—
AUG2DC.mat	—	3562.418	470.681	—
AUG3D.mat	1011.255	—	9601.600	995.319
AUG3DCQP.mat	1.290	14.122	8.679	1.311
bcsstk35.RSA	2.214	3.189	2.407	2.231
bcsstk37.RSA	2.477	3.858	2.733	2.489
bcsstk39.RSA	6.330	8.627	8.624	6.415
BLOCKQP1.rsa	27.813	12.987	0.571	0.780
BLOWEYA.rsa	1.755	0.758	0.146	0.191
bmw3_2.rsa	122.075	87.849	169.583	131.287
BOYD1.RSA	173.722	136.236	25.805	58.484
BOYD2.RSA	1578.594	171.717	2.265	5.834
BRAINPC2.rsa	1.170	0.623	0.175	0.184
BRATU3D.RSA	—	—	—	—
c-55.RSA	18.342	160.956	518.751	42.511
c-58.RSA	18.837	139.839	125.050	42.798
c-59.RSA	14.865	198.365	217.972	214.707
c-62.RSA	55.696	525.402	1782.347	113.562
c-63.RSA	5.203	48.050	79.147	19.085
c-68.RSA	57.426	441.718	793.669	418.083
c-69.RSA	4.757	49.709	67.324	8.250
c-70.RSA	14.455	166.378	243.448	24.343
c-71.RSA	152.513	1409.985	4497.974	295.306
c-72.RSA	7.974	60.473	93.590	20.066

Table 3.3.2.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	31.830	23.589	48.605	31.897
crystk02.RSA	12.002	6.128	10.788	12.050
crystk03.RSA	24.642	16.436	38.499	24.647
DARCY003.rsa	7.432	18.635	7.080	7.752
dawson5.rsa	4.671	6.102	5.584	4.699
DIXMAANL.rsa	0.490	1.399	0.353	0.500
DTOC.mat	–	14.620	–	–
D_PRETOK.rsa	46.194	23.419	82.749	46.212
HELM2D03.rsa	39.170	31.517	46.301	39.306
HELM3D01.rsa	20.041	14.015	29.426	20.131
K1_SAN.rsa	4.035	4.643	8.832	4.067
LINVERSE.rsa	0.061	0.220	0.051	0.063
mario001.rsa	0.442	1.294	0.424	0.464
mario002.rsa	7.412	18.586	7.110	7.747
NCVXBQP1.rsa	9.178	4.234	13.217	9.246
NCVXQP1.mat	58.927	99.598	527.107	59.100
NCVXQP3.rsa	1200.383	772.005	–	1206.741
NCVXQP5.rsa	353.587	196.282	1199.698	358.563
NCVXQP7.rsa	–	2193.013	–	–
NCVXQP9.mat	0.281	0.608	0.473	0.294
olesnik0.rsa	6.271	6.532	10.749	6.323
qa8fk.RSA	180.672	48.891	235.769	181.839
SIT100.rsa	0.864	0.508	0.622	0.868
SPARSINE.rsa	–	–	–	–
SPMSRTL5.rsa	0.167	0.439	0.145	0.166
stokes128.mat	1.839	3.938	2.630	1.869
stokes64.mat	0.336	0.756	0.430	0.339
stokes64s.mat	0.330	0.750	0.427	0.338
tuma1.mat	0.427	0.812	0.586	0.424
tuma2.mat	0.163	0.383	0.223	0.173
TURON_M.rsa	–	23.293	72.322	–
vibrobox.RSA	2.932	4.273	4.883	2.970

Table 3.3.2.3: Analyse time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.253	2.634	0.162	0.265
A2NNSNSL.rsa	11.150	2.489	0.179	0.360
A5ESINDL.rsa	4.309	1.749	0.106	0.186
AUG2D.mat	–	0.700	0.042	–
AUG2DC.mat	–	0.722	0.045	–
AUG3D.mat	0.080	–	0.055	0.091
AUG3DCQP.mat	0.124	1.317	0.095	0.137
bcsstk35.RSA	0.324	0.804	0.356	0.335
bcsstk37.RSA	0.270	0.819	0.330	0.277

Table 3.3.2.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bcsstk39.RSA	0.513	1.246	0.729	0.538
BLOCKQP1.rsa	27.507	12.430	0.181	0.373
BLOWEYA.rsa	1.649	0.658	0.049	0.085
bmw3_2.rsa	2.814	8.871	4.461	3.846
BOYD1.RSA	105.587	135.668	25.136	57.832
BOYD2.RSA	871.005	170.435	0.975	4.469
BRAINPC2.rsa	1.070	0.453	0.049	0.085
BRATU3D.RSA	—	—	—	—
c-55.RSA	0.377	2.033	0.333	0.841
c-58.RSA	0.665	2.177	0.224	0.784
c-59.RSA	0.529	2.670	0.268	1.159
c-62.RSA	0.679	2.812	0.694	1.295
c-63.RSA	0.373	2.383	0.224	0.629
c-68.RSA	0.678	3.720	0.473	2.472
c-69.RSA	0.572	3.829	0.312	0.710
c-70.RSA	0.614	3.899	0.407	0.784
c-71.RSA	1.140	5.334	1.434	2.124
c-72.RSA	0.774	4.368	0.397	0.958
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	0.752	3.545	1.189	0.842
crystk02.RSA	0.199	0.695	0.360	0.221
crystk03.RSA	0.418	1.413	0.926	0.422
DARCY003.rsa	2.649	14.837	1.497	2.953
dawson5.rsa	0.470	3.117	0.418	0.505
DIXMAANL.rsa	0.231	1.135	0.115	0.242
DTOC.mat	—	0.320	—	—
D.PRETOK.rsa	1.002	9.335	2.354	1.100
HELM2D03.rsa	3.250	15.628	3.026	3.496
HELM3D01.rsa	0.445	1.908	0.554	0.502
K1_SAN.rsa	0.309	2.819	0.470	0.348
LINVERSE.rsa	0.030	0.177	0.021	0.031
mario001.rsa	0.147	1.018	0.090	0.166
mario002.rsa	2.639	14.764	1.488	2.932
NCVXBQP1.rsa	0.461	1.741	0.586	0.528
NCVXQP1.mat	0.142	0.480	0.133	0.160
NCVXQP3.rsa	2.106	5.031	—	2.582
NCVXQP5.rsa	1.203	3.451	2.967	1.372
NCVXQP7.rsa	—	6.155	—	—
NCVXQP9.mat	0.062	0.391	0.035	0.072
olesnik0.rsa	0.470	3.835	0.586	0.516
qa8fk.RSA	1.075	6.173	3.161	1.176
SIT100.rsa	0.043	0.313	0.051	0.048
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.082	0.321	0.061	0.077
stokes128.mat	0.230	2.149	0.254	0.266
stokes64.mat	0.053	0.427	0.049	0.055
stokes64s.mat	0.049	0.425	0.048	0.056

Table 3.3.2.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
tuma1.mat	0.075	0.559	0.063	0.078
tuma2.mat	0.039	0.272	0.030	0.047
TURON_M.rsa	–	10.088	2.421	–
vibrobox.RSA	0.176	0.913	0.160	0.207

Table 3.3.2.4: Factorize time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	0.265	0.253	0.273	0.280
A2NNSNL.rsa	0.258	0.248	0.264	0.271
A5ESINDL.rsa	0.169	0.158	0.160	0.175
AUG2D.mat	–	2921.719	303.016	–
AUG2DC.mat	–	3561.514	470.433	–
AUG3D.mat	1010.674	–	9600.898	994.731
AUG3DCQP.mat	1.130	12.760	8.541	1.137
bcsstk35.RSA	1.795	2.268	1.953	1.801
bcsstk37.RSA	2.103	2.918	2.307	2.106
bcsstk39.RSA	5.596	7.129	7.633	5.657
BLOCKQP1.rsa	0.277	0.516	0.360	0.376
BLOWEYA.rsa	0.095	0.090	0.087	0.096
bmw3_2.rsa	117.855	77.702	163.564	125.773
BOYD1.RSA	67.655	0.507	0.605	0.590
BOYD2.RSA	706.424	1.059	1.073	1.134
BRAINPC2.rsa	0.090	0.157	0.112	0.090
BRATU3D.RSA	–	–	–	–
c-55.RSA	17.848	158.814	518.248	41.513
c-58.RSA	18.105	137.564	124.740	41.930
c-59.RSA	14.242	195.570	217.578	213.386
c-62.RSA	54.728	522.366	1781.267	111.949
c-63.RSA	4.745	45.582	78.823	18.355
c-68.RSA	56.558	437.784	792.976	415.402
c-69.RSA	4.087	45.775	66.900	7.431
c-70.RSA	13.706	162.341	242.877	23.390
c-71.RSA	150.912	1404.202	4495.601	292.593
c-72.RSA	7.083	55.983	93.055	18.973
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	30.715	19.763	46.967	30.683
crystk02.RSA	11.660	5.330	10.287	11.687
crystk03.RSA	23.935	14.791	37.221	23.941
DARCY003.rsa	4.405	3.436	5.185	4.421
dawson5.rsa	4.055	2.853	5.008	4.050
DIXMAANL.rsa	0.229	0.229	0.209	0.228
DTOC.mat	–	14.287	–	–
D_PRETOK.rsa	44.482	13.645	79.505	44.423
HELM2D03.rsa	34.953	15.151	42.243	34.861
HELM3D01.rsa	19.406	11.957	28.655	19.439

Table 3.3.2.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
K1_SAN.rsa	3.582	1.715	8.167	3.577
LINVERSE.rsa	0.027	0.038	0.026	0.028
mario001.rsa	0.270	0.251	0.307	0.273
mario002.rsa	4.396	3.460	5.222	4.431
NCVXBQP1.rsa	8.589	2.405	12.468	8.590
NCVXQP1.mat	58.620	99.002	526.719	58.770
NCVXQP3.rsa	1196.533	766.083	—	1202.451
NCVXQP5.rsa	351.516	192.379	1195.584	356.313
NCVXQP7.rsa	—	2185.431	—	—
NCVXQP9.mat	0.209	0.207	0.427	0.210
olesnik0.rsa	5.603	2.547	9.914	5.610
qa8fk.RSA	178.629	42.170	231.409	179.689
SIT100.rsa	0.797	0.185	0.550	0.796
SPARSINE.rsa	—	—	—	—
SPMSRTL5.rsa	0.075	0.104	0.074	0.079
stokes128.mat	1.510	1.688	2.269	1.507
stokes64.mat	0.268	0.309	0.362	0.269
stokes64s.mat	0.266	0.306	0.361	0.267
tuma1.mat	0.332	0.236	0.498	0.327
tuma2.mat	0.117	0.103	0.183	0.118
TURON_M.rsa	—	12.726	68.927	—
vibrobox.RSA	2.701	3.294	4.654	2.706

Table 3.3.2.5: Solution time given factors (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0.038	0.043	0.038	0.038
A2NNSNSL.rsa	0.039	0.041	0.038	0.039
A5ESINDL.rsa	0.023	0.026	0.025	0.023
AUG2D.mat	—	0.181	0.173	—
AUG2DC.mat	—	0.182	0.203	—
AUG3D.mat	0.501	—	0.646	0.497
AUG3DCQP.mat	0.036	0.045	0.043	0.037
bcsstk35.RSA	0.095	0.116	0.098	0.096
bcsstk37.RSA	0.103	0.121	0.096	0.105
bcsstk39.RSA	0.221	0.252	0.262	0.221
BLOCKQP1.rsa	0.029	0.040	0.030	0.031
BLOWEYA.rsa	0.011	0.011	0.011	0.011
bmw3_2.rsa	1.406	1.276	1.558	1.667
BOYD1.RSA	0.480	0.061	0.064	0.062
BOYD2.RSA	1.165	0.224	0.218	0.230
BRAINPC2.rsa	0.011	0.013	0.014	0.010
BRATU3D.RSA	—	—	—	—
c-55.RSA	0.117	0.109	0.170	0.156
c-58.RSA	0.067	0.098	0.086	0.084
c-59.RSA	0.095	0.125	0.126	0.163
c-62.RSA	0.289	0.224	0.385	0.318

Table 3.3.2.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
c-63.RSA	0.085	0.085	0.101	0.102
c-68.RSA	0.189	0.215	0.220	0.209
c-69.RSA	0.098	0.104	0.111	0.109
c-70.RSA	0.135	0.138	0.164	0.170
c-71.RSA	0.460	0.450	0.940	0.589
c-72.RSA	0.117	0.122	0.138	0.134
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	0.363	0.281	0.449	0.371
crystk02.RSA	0.142	0.103	0.141	0.142
crystk03.RSA	0.289	0.231	0.352	0.284
DARCY003.rsa	0.379	0.361	0.397	0.378
dawson5.rsa	0.145	0.132	0.158	0.144
DIXMAANL.rsa	0.029	0.034	0.029	0.029
DTOC.mat	—	0.013	—	—
D_PRETOK.rsa	0.710	0.438	0.890	0.689
HELM2D03.rsa	0.967	0.738	1.033	0.950
HELM3D01.rsa	0.190	0.150	0.217	0.190
K1_SAN.rsa	0.143	0.109	0.194	0.142
LINVERSE.rsa	0.004	0.005	0.003	0.004
mario001.rsa	0.024	0.025	0.026	0.024
mario002.rsa	0.377	0.362	0.400	0.384
NCVXBQP1.rsa	0.129	0.088	0.163	0.128
NCVXQP1.mat	0.165	0.116	0.256	0.170
NCVXQP3.rsa	1.696	0.891	—	1.708
NCVXQP5.rsa	0.868	0.452	1.147	0.877
NCVXQP7.rsa	—	1.428	—	—
NCVXQP9.mat	0.010	0.010	0.011	0.012
olesnik0.rsa	0.197	0.150	0.249	0.196
qa8fk.RSA	0.968	0.548	1.199	0.973
SIT100.rsa	0.023	0.009	0.020	0.023
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.010	0.014	0.011	0.010
stokes128.mat	0.099	0.101	0.107	0.096
stokes64.mat	0.015	0.020	0.020	0.015
stokes64s.mat	0.015	0.019	0.019	0.015
tuma1.mat	0.020	0.017	0.024	0.019
tuma2.mat	0.007	0.007	0.009	0.008
TURON_M.rsa	—	0.479	0.973	—
vibrobox.RSA	0.056	0.066	0.069	0.057

Table 3.3.2.6: Minimum memory required (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.4E+01	1.4E+01	1.4E+01	1.4E+01
A2NNSNSL.rsa	1.3E+01	1.4E+01	1.4E+01	1.4E+01
A5ESINDL.rsa	9.2E+00	9.5E+00	9.4E+00	9.6E+00

Table 3.3.2.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
AUG2D.mat	–	1.6E+03	1.6E+03	–
AUG2DC.mat	–	1.7E+03	1.8E+03	–
AUG3D.mat	2.6E+03	–	2.9E+03	2.6E+03
AUG3DCQP.mat	1.9E+01	1.9E+01	1.9E+01	1.9E+01
bcsstk35.RSA	4.6E+01	4.8E+01	4.7E+01	4.6E+01
bcsstk37.RSA	4.4E+01	4.6E+01	4.5E+01	4.4E+01
bcsstk39.RSA	8.9E+01	9.6E+01	9.9E+01	8.9E+01
BLOCKQP1.rsa	1.6E+01	3.0E+01	2.7E+01	2.7E+01
BLOWEYA.rsa	5.1E+00	5.2E+00	5.1E+00	5.1E+00
bmw3_2.rsa	7.0E+02	5.8E+02	7.5E+02	7.0E+02
BOYD1.RSA	2.5E+02	4.1E+01	4.4E+01	4.3E+01
BOYD2.RSA	1.5E+03	6.1E+01	6.2E+01	6.2E+01
BRAINPC2.rsa	5.8E+00	6.4E+00	5.8E+00	5.8E+00
BRATU3D.RSA	–	–	–	–
c-55.RSA	1.1E+02	5.2E+01	1.1E+02	1.5E+02
c-58.RSA	9.0E+01	5.4E+01	7.9E+01	1.0E+02
c-59.RSA	8.4E+01	6.7E+01	7.8E+01	1.0E+02
c-62.RSA	1.9E+02	9.7E+01	2.1E+02	3.3E+02
c-63.RSA	4.3E+01	3.7E+01	4.8E+01	5.3E+01
c-68.RSA	2.0E+02	8.7E+01	1.5E+02	2.1E+02
c-69.RSA	4.3E+01	4.5E+01	5.5E+01	5.3E+01
c-70.RSA	9.9E+01	6.6E+01	9.0E+01	1.3E+02
c-71.RSA	4.6E+02	1.9E+02	4.3E+02	8.2E+02
c-72.RSA	6.3E+01	4.9E+01	6.7E+01	8.7E+01
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	1.6E+02	1.1E+02	2.0E+02	1.6E+02
crystk02.RSA	8.5E+01	5.4E+01	7.5E+01	8.5E+01
crystk03.RSA	1.5E+02	1.2E+02	1.8E+02	1.5E+02
DARCY003.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
dawson5.rsa	6.3E+01	5.3E+01	6.6E+01	6.3E+01
DIXMAANL.rsa	1.2E+01	1.2E+01	1.1E+01	1.2E+01
DTOC.mat	–	3.5E+02	–	–
D_PRETOK.rsa	2.8E+02	1.5E+02	3.7E+02	2.8E+02
HELM2D03.rsa	3.3E+02	2.3E+02	3.6E+02	3.3E+02
HELM3D01.rsa	1.2E+02	6.4E+01	1.1E+02	1.2E+02
K1_SAN.rsa	5.2E+01	3.7E+01	7.6E+01	5.2E+01
LINVERSE.rsa	2.7E+00	2.9E+00	2.7E+00	2.7E+00
mario001.rsa	9.6E+00	9.5E+00	1.0E+01	9.6E+00
mario002.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
NCVXBQP1.rsa	7.5E+01	3.1E+01	8.4E+01	7.5E+01
NCVXQP1.mat	1.9E+02	5.6E+01	1.8E+02	1.9E+02
NCVXQP3.rsa	1.4E+03	2.9E+02	–	1.4E+03
NCVXQP5.rsa	7.3E+02	1.5E+02	5.5E+02	7.3E+02
NCVXQP7.rsa	–	4.6E+02	–	–
NCVXQP9.mat	5.2E+00	3.7E+00	5.0E+00	5.2E+00
olesnik0.rsa	7.5E+01	5.1E+01	9.6E+01	7.5E+01
qa8fk.RSA	4.7E+02	2.3E+02	5.4E+02	4.7E+02

Table 3.3.2.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
SIT100.rsa	1.2E+01	4.8E+00	9.3E+00	1.2E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLs.rsa	6.0E+00	6.8E+00	6.0E+00	6.0E+00
stokes128.mat	3.4E+01	3.5E+01	4.1E+01	3.4E+01
stokes64.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
stokes64s.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
tuma1.mat	8.7E+00	7.5E+00	1.1E+01	8.7E+00
tuma2.mat	4.0E+00	3.8E+00	5.1E+00	4.0E+00
TURON_M.rsa	—	1.5E+02	3.3E+02	—
vibrobox.RSA	3.3E+01	3.2E+01	4.4E+01	3.3E+01

Table 3.3.2.7: Actual memory used (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	1.7E+01	2.3E+01	1.8E+01	1.8E+01
A2NNSNSL.rsa	1.6E+01	2.3E+01	1.8E+01	1.7E+01
A5ESINDL.rsa	1.1E+01	1.6E+01	1.1E+01	1.2E+01
AUG2D.mat	—	2.3E+03	2.5E+03	—
AUG2DC.mat	—	2.2E+03	2.3E+03	—
AUG3D.mat	3.1E+03	—	3.4E+03	3.1E+03
AUG3DCQP.mat	2.1E+01	2.2E+01	2.1E+01	2.1E+01
bcsstk35.RSA	5.4E+01	5.8E+01	5.4E+01	5.4E+01
bcsstk37.RSA	4.9E+01	5.5E+01	5.0E+01	5.0E+01
bcsstk39.RSA	1.0E+02	1.1E+02	1.1E+02	1.0E+02
BLOCKQP1.rsa	2.0E+01	3.8E+01	3.2E+01	3.2E+01
BLOWEYA.rsa	6.5E+00	9.4E+00	6.9E+00	6.6E+00
bmw3.2.rsa	8.0E+02	6.4E+02	8.1E+02	8.0E+02
BOYD1.RSA	2.6E+02	5.5E+01	5.3E+01	5.1E+01
BOYD2.RSA	1.5E+03	1.1E+02	7.3E+01	7.6E+01
BRAINPC2.rsa	6.9E+00	9.7E+00	7.6E+00	7.0E+00
BRATU3D.RSA	—	—	—	—
c-55.RSA	1.2E+02	5.9E+01	1.2E+02	1.7E+02
c-58.RSA	9.9E+01	6.0E+01	9.0E+01	1.2E+02
c-59.RSA	9.0E+01	7.2E+01	8.2E+01	1.2E+02
c-62.RSA	2.2E+02	1.1E+02	2.2E+02	3.5E+02
c-63.RSA	4.8E+01	4.2E+01	5.2E+01	6.0E+01
c-68.RSA	2.0E+02	1.0E+02	1.6E+02	2.3E+02
c-69.RSA	5.0E+01	5.2E+01	6.3E+01	6.2E+01
c-70.RSA	1.1E+02	7.8E+01	9.6E+01	1.4E+02
c-71.RSA	5.0E+02	2.1E+02	4.6E+02	8.6E+02
c-72.RSA	7.0E+01	5.8E+01	7.4E+01	9.4E+01
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	1.8E+02	1.2E+02	2.1E+02	1.8E+02
crystk02.RSA	9.7E+01	6.1E+01	8.0E+01	9.7E+01
crystk03.RSA	1.7E+02	1.3E+02	2.0E+02	1.7E+02
DARCY003.rsa	1.2E+02	1.3E+02	1.4E+02	1.3E+02

Table 3.3.2.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
dawson5.rsa	7.1E+01	6.1E+01	7.4E+01	7.2E+01
DIXMAANL.rsa	1.4E+01	1.8E+01	1.5E+01	1.4E+01
DTOC.mat	–	4.1E+02	–	–
D_PRETOK.rsa	3.1E+02	1.8E+02	3.8E+02	3.1E+02
HELM2D03.rsa	3.6E+02	2.6E+02	3.8E+02	3.6E+02
HELM3D01.rsa	1.3E+02	7.2E+01	1.2E+02	1.3E+02
K1_SAN.rsa	5.7E+01	4.3E+01	8.2E+01	5.8E+01
LINVERSE.rsa	3.2E+00	4.8E+00	3.1E+00	3.3E+00
mario001.rsa	1.1E+01	1.3E+01	1.2E+01	1.1E+01
mario002.rsa	1.2E+02	1.3E+02	1.4E+02	1.3E+02
NCVXBQP1.rsa	7.9E+01	4.1E+01	8.9E+01	7.9E+01
NCVXQP1.mat	1.9E+02	9.8E+01	1.8E+02	1.9E+02
NCVXQP3.rsa	1.5E+03	3.1E+02	–	1.5E+03
NCVXQP5.rsa	8.4E+02	1.9E+02	6.9E+02	8.4E+02
NCVXQP7.rsa	–	4.8E+02	–	–
NCVXQP9.mat	6.1E+00	5.2E+00	6.1E+00	6.1E+00
olesnik0.rsa	8.3E+01	5.8E+01	1.0E+02	8.3E+01
qa8fk.RSA	5.3E+02	2.6E+02	5.9E+02	5.3E+02
SIT100.rsa	1.4E+01	6.0E+00	1.0E+01	1.4E+01
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	7.1E+00	1.0E+01	7.0E+00	7.2E+00
stokes128.mat	3.6E+01	3.9E+01	4.5E+01	3.7E+01
stokes64.mat	8.4E+00	9.5E+00	9.9E+00	8.5E+00
stokes64s.mat	8.4E+00	9.5E+00	9.9E+00	8.5E+00
tuma1.mat	9.8E+00	9.1E+00	1.2E+01	9.9E+00
tuma2.mat	4.7E+00	4.9E+00	6.1E+00	4.7E+00
TURON_M.rsa	–	1.7E+02	3.6E+02	–
vibrobox.RSA	3.6E+01	3.6E+01	4.6E+01	3.6E+01

Table 3.3.2.8: Number of integers used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	499964	488063	500041	510028
A2NNSNSL.rsa	476517	483054	476593	496371
A5ESINDL.rsa	335003	315020	335009	345008
AUG2D.mat	–	1696654	350480	–
AUG2DC.mat	–	1864732	383853	–
AUG3D.mat	319170	–	2684432	319170
AUG3DCQP.mat	237520	913014	499231	237520
bcsstk35.RSA	227235	257689	230725	227235
bcsstk37.RSA	204333	239321	207393	204333
bcsstk39.RSA	395732	444080	410448	395732
BLOCKQP1.rsa	399890	320025	400023	400020
BLOWEYA.rsa	140001	146564	130006	140002
bmw3.2.rsa	2080336	2380319	2192000	2080336
BOYD1.RSA	435270	838862	838835	838792
BOYD2.RSA	2140797	2195779	2195775	2195771

Table 3.3.2.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BRAINPC2.rsa	151810	136138	213875	151810
BRATU3D.RSA	—	—	—	—
c-55.RSA	432974	2260962	3289719	648097
c-58.RSA	571050	1915631	1548690	872739
c-59.RSA	500207	2230221	2033716	1758490
c-62.RSA	605110	4410054	7011673	855054
c-63.RSA	428798	1435576	1439617	755742
c-68.RSA	754158	3602630	3983611	1991247
c-69.RSA	600132	1786367	1764882	683146
c-70.RSA	647169	2387569	2562800	767608
c-71.RSA	1033717	7837391	11862274	1260328
c-72.RSA	738899	1960644	1989185	933284
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	841598	984319	883359	841598
crystk02.RSA	173257	183323	182530	173257
crystk03.RSA	317983	348973	330965	317983
DARCY003.rsa	1937373	2005536	1962272	1937373
dawson5.rsa	564145	617506	582124	564145
DIXMAANL.rsa	459959	481335	389981	459959
DTOC.mat	—	174337	—	—
D_PRETOK.rsa	1305394	1313694	1347215	1305394
HELM2D03.rsa	3744078	3897412	3825244	3744078
HELM3D01.rsa	482270	612625	559374	482270
K1_SAN.rsa	442337	447584	469478	442337
LINVERSE.rsa	41989	59811	41995	41989
mario001.rsa	186966	193916	189652	186966
mario002.rsa	1937373	2005536	1962272	1937373
NCVXBQP1.rsa	517265	518335	534043	517265
NCVXQP1.mat	232708	609999	925811	232708
NCVXQP3.rsa	2084285	4363483	—	2084285
NCVXQP5.rsa	1230776	2143379	2908481	1230776
NCVXQP7.rsa	—	7526712	—	—
NCVXQP9.mat	91814	108076	106108	91814
olesnik0.rsa	581713	588354	614863	581713
qa8fk.RSA	1861292	1119350	1556234	1861292
SIT100.rsa	85906	69634	84564	85906
SPARSINE.rsa	—	—	—	—
SPMSRTLs.rsa	129970	150801	129975	129970
stokes128.mat	306893	398853	317926	306893
stokes64.mat	76565	99199	78726	76565
stokes64s.mat	76565	99199	78726	76565
tuma1.mat	122997	127076	127748	122997
tuma2.mat	67108	70505	70326	67108
TURON_M.rsa	—	1341306	1393906	—
vibrobox.RSA	217871	291051	222172	217871

Table 3.3.2.9: Number of reals used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	340046	349813	340031	350035
A2NNSNSL.rsa	324407	329192	324392	336378
A5ESINDL.rsa	215002	230003	215002	225001
AUG2D.mat	–	6114686	6521828	–
AUG2DC.mat	–	6191556	7704686	–
AUG3D.mat	20253212	–	18661584	20253212
AUG3DCQP.mat	958084	1009873	1003491	958084
bcsstk35.RSA	2730502	3071020	2878066	2730502
bcsstk37.RSA	2824145	3248113	3004411	2824145
bcsstk39.RSA	6688229	7536059	7852736	6688229
BLOCKQP1.rsa	380113	780068	380068	380068
BLOWEYA.rsa	140008	160945	130009	140009
bmw3_2.rsa	52963147	45753885	59778457	52963147
BOYD1.RSA	26694808	652378	652378	652378
BOYD2.RSA	61603776	1263167	1263167	1263171
BRAINPC2.rsa	158695	306763	158697	158699
BRATU3D.RSA	–	–	–	–
c-55.RSA	4712382	3294587	5168011	6779201
c-58.RSA	2270842	2574907	2365903	2385969
c-59.RSA	3285590	3324402	3279860	4590716
c-62.RSA	10464882	6508368	10933899	14252644
c-63.RSA	2290982	2134757	2376334	2732959
c-68.RSA	6504445	5080374	6178885	7426171
c-69.RSA	2434497	2498774	2696315	3087274
c-70.RSA	4393890	3461067	4234877	5887278
c-71.RSA	20184253	12026647	20207062	28916175
c-72.RSA	3161838	2755401	3306942	3915951
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	14132982	9693996	17227168	14132982
crystk02.RSA	6098260	4185822	5852382	6098260
crystk03.RSA	11904216	9480888	14710431	11904216
DARCY003.rsa	6941313	6384124	7628724	6941313
dawson5.rsa	4624921	3999726	5211272	4624921
DIXMAANL.rsa	339981	383144	349980	339981
DTOC.mat	–	289617	–	–
D_PRETOK.rsa	24522476	13612877	33441764	24522476
HELM2D03.rsa	28015793	18900733	31686809	28015793
HELM3D01.rsa	7629570	5082794	8145267	7629570
K1_SAN.rsa	4282567	2918071	6567122	4282567
LINVERSE.rsa	53988	92381	53988	53988
mario001.rsa	529699	523591	582220	529699
mario002.rsa	6941313	6384124	7628724	6941313
NCVXBQP1.rsa	4141288	2035410	5375688	4141288
NCVXQP1.mat	8477084	3626436	8719736	8477084
NCVXQP3.rsa	78881102	23176871	–	78881102
NCVXQP5.rsa	38990831	12336577	37572285	38990831
NCVXQP7.rsa	–	36449962	–	–

Table 3.3.2.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	262694	206760	273178	262694
olesnik0.rsa	6061585	4094599	8421776	6061585
qa8fk.RSA	40901710	21607991	51388343	40901710
SIT100.rsa	869620	363781	732809	869620
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129971	229096	129971	129971
stokes128.mat	2714396	2908653	3362745	2714396
stokes64.mat	557892	608953	664992	557892
stokes64s.mat	557892	608977	664992	557892
tuma1.mat	536123	444226	693366	536123
tuma2.mat	224253	210353	301202	224253
TURON_M.rsa	—	12984289	31248580	—
vibrobox.RSA	2086588	2260948	2672558	2086588

Table 3.3.2.10: Total number of integers used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	505049	533068	545045	555057
A2NNSNSL.rsa	482995	526101	519644	539446
A5ESINDL.rsa	340016	340033	360017	370021
AUG2D.mat	—	1677076	331018	—
AUG2DC.mat	—	1844348	363477	—
AUG3D.mat	296000	—	2659181	296000
AUG3DCQP.mat	239580	913047	499300	239580
bcsstk35.RSA	770442	770442	770442	770442
bcsstk37.RSA	608748	608748	608748	608748
bcsstk39.RSA	1114810	1114810	1114810	1114810
BLOCKQP1.rsa	420062	560062	640053	640053
BLOWEYA.rsa	150024	146640	150024	150024
bmw3.2.rsa	5985363	5985363	5985363	5985363
BOYD1.RSA	838820	1238275	1332492	1312115
BOYD2.RSA	2288358	2382983	2411473	2426941
BRAINPC2.rsa	207060	138212	213955	207069
BRATU3D.RSA	—	—	—	—
c-55.RSA	448582	2260977	3289754	673511
c-58.RSA	587826	1915646	1548712	892526
c-59.RSA	510453	2230259	2033788	1782175
c-62.RSA	632337	4410059	7011691	898651
c-63.RSA	433938	1435597	1439710	765430
c-68.RSA	769246	3602646	3983645	2038677
c-69.RSA	604002	1786446	1764950	695602
c-70.RSA	657874	2387585	2562896	783354
c-71.RSA	1062901	7837410	11862366	1312747
c-72.RSA	744548	1960734	1989303	945117
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	866219	987793	894550	866219

Table 3.3.2.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk02.RSA	505244	505244	505244	505244
crystk03.RSA	912638	912638	912638	912638
DARCY003.rsa	1939303	2006678	1964020	1939303
dawson5.rsa	582864	622109	588856	582864
DIXMAANL.rsa	459984	481386	390001	459984
DTOC.mat	–	169346	–	–
D_PRETOK.rsa	1314317	1315946	1354725	1314317
HELM2D03.rsa	3752224	3901018	3831360	3752224
HELM3D01.rsa	496295	617525	564262	496295
K1_SAN.rsa	445053	448757	472979	445053
LINVERSE.rsa	71992	72008	71992	71992
mario001.rsa	187570	194278	190256	187570
mario002.rsa	1939303	2006678	1964020	1939303
NCVXBQP1.rsa	519658	521468	541085	519658
NCVXQP1.mat	243536	610843	927154	243536
NCVXQP3.rsa	2119970	4365181	–	2119970
NCVXQP5.rsa	1258063	2144230	2909748	1258063
NCVXQP7.rsa	–	7526989	–	–
NCVXQP9.mat	92584	108157	106351	92584
olesnik0.rsa	585541	589626	618144	585541
qa8fk.RSA	1892539	1133613	1577613	1892539
SIT100.rsa	88317	70110	85790	88317
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	159976	159976	159977	159976
stokes128.mat	362008	400431	362008	362008
stokes64.mat	90904	99981	90904	90904
stokes64s.mat	90904	99981	90904	90904
tuma1.mat	124164	127725	128821	124164
tuma2.mat	67737	70876	71069	67737
TURON_M.rsa	–	1343735	1400010	–
vibrobox.RSA	230085	299522	232008	230085

Table 3.3.2.11: Total number of reals used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	450038	529825	520043	530079
A2NNSNSL.rsa	409414	493773	488973	500991
A5ESINDL.rsa	249997	280030	265012	275016
AUG2D.mat	–	201005184	203913793	–
AUG2DC.mat	–	216156560	221446339	–
AUG3D.mat	328977068	–	355690986	328977068
AUG3DCQP.mat	1726157	1430626	1576630	1726157
bcsstk35.RSA	2987166	3225871	3107242	2987166
bcsstk37.RSA	3264551	3577173	3457718	3264551
bcsstk39.RSA	7106639	8066011	8412126	7106639
BLOCKQP1.rsa	420242	2100227	1700210	1700221
BLOWEYA.rsa	140055	151216	140044	140056
bmw3.2.rsa	66435660	50549008	71919466	66435660

Table 3.3.2.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD1.RSA	28289564	1805153	2101859	2030546
BOYD2.RSA	182449799	1450379	1507382	1516334
BRAINPC2.rsa	193323	307262	193318	193318
BRATU3D.RSA	—	—	—	—
c-55.RSA	13203567	4564293	11659991	17693133
c-58.RSA	9943532	4656835	8054562	11520015
c-59.RSA	9261228	6239169	7714183	11103050
c-62.RSA	22871375	8836919	21359539	39138596
c-63.RSA	4258834	2954024	4371329	5244986
c-68.RSA	23456529	7780354	15697063	23728178
c-69.RSA	3726913	3360969	4622294	4923730
c-70.RSA	10583360	5663561	8500970	14576416
c-71.RSA	54825009	18316485	45922289	100025236
c-72.RSA	5866470	3481076	5725761	8792856
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	18391275	11496347	23552661	18391275
crystk02.RSA	8827118	4946689	7553397	8827118
crystk03.RSA	15713960	11223705	19640568	15713960
DARCY003.rsa	7562066	6614318	8277800	7562066
dawson5.rsa	5752363	4408102	6159143	5752363
DIXMAANL.rsa	380038	383271	350058	380038
DTOC.mat	—	44017125	—	—
D.PRETOK.rsa	31140627	15045262	41543204	31140627
HELM2D03.rsa	32569973	20003852	35809219	32569973
HELM3D01.rsa	13761359	6809319	13103162	13761359
K1.SAN.rsa	4996624	3148728	7959541	4996624
LINVERSE.rsa	60021	92742	60021	60021
mario001.rsa	575236	548562	658749	575236
mario002.rsa	7562066	6614318	8277800	7562066
NCVXBQP1.rsa	8068030	2623074	9192875	8068030
NCVXQP1.mat	22959582	6430981	21834233	22959582
NCVXQP3.rsa	176822509	33110131	—	176822509
NCVXQP5.rsa	88843236	16797552	65985531	88843236
NCVXQP7.rsa	—	52504504	—	—
NCVXQP9.mat	423137	226252	392381	423137
olesnik0.rsa	7451672	4411526	9988846	7451672
qa8fk.RSA	55505819	25207355	64290070	55505819
SIT100.rsa	1306438	410240	968008	1306438
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	130005	229228	130011	130005
stokes128.mat	2946251	3095685	3809791	2946251
stokes64.mat	622493	655527	766876	622493
stokes64s.mat	622493	655527	766876	622493
tuma1.mat	687742	524576	939946	687742
tuma2.mat	277035	242206	413967	277035
TURON_M.rsa	—	14189897	36634469	—
vibrobox.RSA	3408950	3313508	4731983	3408950

Table 3.3.2.12: Norm of scaled residuals

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	3.5E-15	1.5E-15	9.5E-16	1.4E-15
A2NNSNSL.rsa	9.8E-16	1.0E-15	7.8E-16	1.9E-15
A5ESINDL.rsa	1.4E-14	5.1E-15	1.2E-14	1.6E-15
AUG2D.mat	—	0.0E+00	0.0E+00	—
AUG2DC.mat	—	0.0E+00	0.0E+00	—
AUG3D.mat	0.0E+00	—	0.0E+00	0.0E+00
AUG3DCQP.mat	1.1E-16	1.1E-16	1.1E-16	1.1E-16
bcsstk35.RSA	3.6E-16	3.1E-16	5.7E-16	3.6E-16
bcsstk37.RSA	1.1E-15	1.2E-15	1.2E-15	1.1E-15
bcsstk39.RSA	2.4E-16	2.4E-16	2.5E-16	2.4E-16
BLOCKQP1.rsa	1.2E-12	1.2E-12	1.2E-12	1.2E-12
BLOWEYA.rsa	1.7E-17	5.6E-15	1.8E-17	2.4E-17
bmw3_2.rsa	2.7E-16	2.5E-16	1.5E-16	2.7E-16
BOYD1.RSA	1.3E-09	1.0E-09	1.4E-09	2.9E-09
BOYD2.RSA	7.0E-07	7.8E-07	7.7E-07	7.6E-07
BRAINPC2.rsa	8.3E-12	8.0E-05	6.8E-12	7.3E-12
BRATU3D.RSA	—	—	—	—
c-55.RSA	6.2E-11	1.7E-10	5.7E-11	7.7E-11
c-58.RSA	2.5E-10	6.6E-10	3.2E-10	3.3E-09
c-59.RSA	1.8E-09	1.4E-09	1.2E-09	7.8E-09
c-62.RSA	5.2E-10	2.0E-09	5.9E-10	6.2E-10
c-63.RSA	3.8E-10	4.9E-10	3.4E-10	3.6E-10
c-68.RSA	5.7E-14	2.5E-13	3.1E-13	7.7E-14
c-69.RSA	4.9E-11	7.7E-11	9.2E-11	3.1E-11
c-70.RSA	1.3E-10	5.4E-11	4.7E-11	3.9E-11
c-71.RSA	3.8E-10	1.5E-09	4.3E-10	6.0E-10
c-72.RSA	4.7E-11	3.0E-10	4.4E-11	4.8E-11
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	3.4E-11	2.1E-11	8.8E-11	3.4E-11
crystk02.RSA	2.3E-15	2.2E-15	2.2E-15	2.3E-15
crystk03.RSA	2.9E-15	3.0E-15	2.9E-15	2.9E-15
DARCY003.rsa	1.8E-15	1.8E-15	2.1E-15	1.8E-15
dawson5.rsa	1.2E-11	1.4E-11	3.6E-12	1.2E-11
DIXMAANL.rsa	3.6E-14	1.9E-15	5.8E-15	3.6E-14
DTOC.mat	—	3.9E-09	—	—
D_PRETOK.rsa	2.1E-07	3.6E-08	4.7E-07	2.1E-07
HELM2D03.rsa	4.3E-12	1.4E-11	3.7E-12	4.3E-12
HELM3D01.rsa	3.5E-12	4.4E-12	2.2E-11	3.5E-12
K1_SAN.rsa	4.7E-15	2.2E-15	2.2E-14	4.7E-15
LINVERSE.rsa	7.1E-16	5.4E-16	1.8E-16	7.1E-16
mario001.rsa	1.1E-15	1.0E-15	2.2E-15	1.1E-15
mario002.rsa	1.8E-15	1.8E-15	2.1E-15	1.8E-15
NCVXBQP1.rsa	1.2E-13	7.7E-14	5.4E-13	1.2E-13
NCVXQP1.mat	6.0E-16	2.8E-16	3.7E-16	6.0E-16
NCVXQP3.rsa	3.7E-09	2.8E-09	—	3.7E-09
NCVXQP5.rsa	2.0E-09	3.9E-10	1.6E-09	2.0E-09
NCVXQP7.rsa	—	6.8E-11	—	—

Table 3.3.2.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	1.3E-16	4.2E-16	1.0E-15	1.3E-16
olesnik0.rsa	5.3E-15	1.2E-15	6.3E-15	5.3E-15
qa8fk.RSA	1.7E-14	1.2E-14	1.9E-14	1.7E-14
SIT100.rsa	1.9E-15	3.9E-15	1.2E-15	1.9E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	2.8E-13	2.3E-14	4.6E-14	2.8E-13
stokes128.mat	3.5E-13	8.7E-13	1.3E-11	3.5E-13
stokes64.mat	1.6E-13	1.7E-13	5.2E-14	1.6E-13
stokes64s.mat	9.2E-15	3.6E-15	4.5E-14	9.2E-15
tuma1.mat	1.3E-14	2.0E-14	2.9E-14	1.3E-14
tuma2.mat	1.0E-14	2.0E-14	3.0E-14	1.0E-14
TURON_M.rsa	–	5.8E-05	3.8E-05	–
vibrobox.RSA	3.3E-16	3.1E-16	3.3E-16	3.3E-16

Table 3.3.2.13: Norm of scaled residuals following a single refinement

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	5.8E-17	9.2E-17	6.0E-17	6.0E-17
A2NNSNSL.rsa	3.9E-17	3.3E-17	3.2E-17	3.6E-17
A5ESINDL.rsa	6.2E-17	2.0E-16	2.8E-17	8.6E-17
AUG2D.mat	–	0.0E+00	0.0E+00	–
AUG2DC.mat	–	0.0E+00	0.0E+00	–
AUG3D.mat	0.0E+00	–	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-17	2.3E-17	1.3E-17	1.3E-17
bcsstk35.RSA	7.6E-16	4.2E-16	3.4E-16	7.6E-16
bcsstk37.RSA	9.9E-16	9.7E-16	9.9E-16	9.9E-16
bcsstk39.RSA	1.9E-16	1.9E-16	1.9E-16	1.9E-16
BLOCKQP1.rsa	4.9E-14	2.4E-15	2.4E-15	2.4E-15
BLOWEYA.rsa	1.3E-17	5.5E-15	1.3E-17	2.1E-17
bmw3.2.rsa	2.7E-16	2.3E-16	2.6E-16	2.7E-16
BOYD1.RSA	3.7E-14	4.1E-14	2.6E-14	6.3E-14
BOYD2.RSA	3.9E-15	1.3E-15	2.0E-15	2.0E-15
BRAINPC2.rsa	1.3E-15	2.8E-08	1.1E-15	1.9E-15
BRATU3D.RSA	–	–	–	–
c-55.RSA	1.2E-17	1.3E-17	1.2E-17	1.2E-17
c-58.RSA	2.2E-16	1.0E-15	1.4E-16	7.0E-16
c-59.RSA	3.8E-15	5.0E-15	1.0E-15	6.2E-15
c-62.RSA	1.0E-15	3.7E-15	2.0E-15	1.5E-15
c-63.RSA	8.5E-17	1.4E-16	9.7E-17	4.5E-17
c-68.RSA	3.3E-17	3.3E-17	3.9E-17	3.9E-17
c-69.RSA	9.8E-17	1.8E-16	6.4E-17	5.3E-17
c-70.RSA	5.5E-17	9.9E-18	6.6E-18	4.7E-18
c-71.RSA	1.6E-16	5.3E-16	3.4E-16	3.4E-15
c-72.RSA	4.9E-17	2.5E-16	6.7E-18	4.6E-17
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16

Table 3.3.2.13: Norm of scaled residuals following a single refinement (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk02.RSA	1.4E-15	1.5E-15	1.5E-15	1.4E-15
crystk03.RSA	1.8E-15	1.8E-15	1.9E-15	1.8E-15
DARCY003.rsa	9.3E-17	9.5E-17	9.8E-17	9.3E-17
dawson5.rsa	2.3E-16	2.3E-16	2.2E-16	2.3E-16
DIXMAANL.rsa	1.0E-16	1.0E-16	1.0E-16	1.0E-16
DTOC.mat	–	6.5E-13	–	–
D_PRETOK.rsa	1.6E-09	4.0E-11	5.6E-09	1.6E-09
HELM2D03.rsa	3.6E-15	3.6E-15	3.6E-15	3.6E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.1E-16	1.0E-16	1.2E-16	1.1E-16
LINVERSE.rsa	9.7E-17	9.6E-17	9.7E-17	9.7E-17
mario001.rsa	8.6E-17	9.4E-17	9.2E-17	8.6E-17
mario002.rsa	9.3E-17	9.5E-17	9.8E-17	9.3E-17
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.0E-16	1.1E-16	1.0E-16	1.0E-16
NCVXQP3.rsa	6.6E-16	2.0E-16	–	6.6E-16
NCVXQP5.rsa	1.4E-16	7.1E-15	7.9E-15	1.4E-16
NCVXQP7.rsa	–	1.3E-16	–	–
NCVXQP9.mat	4.5E-24	1.8E-24	1.2E-24	4.5E-24
olesnik0.rsa	9.2E-17	8.7E-17	8.8E-17	9.2E-17
qa8fk.RSA	5.4E-15	5.7E-15	6.4E-15	5.4E-15
SIT100.rsa	2.1E-16	2.2E-16	2.1E-16	2.1E-16
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
stokes128.mat	2.0E-13	4.9E-13	1.4E-09	2.0E-13
stokes64.mat	7.3E-14	4.1E-13	3.1E-14	7.3E-14
stokes64s.mat	8.4E-15	3.6E-15	4.1E-14	8.4E-15
tuma1.mat	7.0E-17	7.5E-17	7.5E-17	7.0E-17
tuma2.mat	7.1E-17	7.2E-17	7.5E-17	7.1E-17
TURON_M.rsa	–	3.1E-07	2.8E-07	–
vibrobox.RSA	1.3E-16	1.2E-16	4.8E-15	1.3E-16

3.3.3 Default runs on scaled matrices

Here are the results obtained with the (solver-dependent) default threshold pivoting parameter after the original matrix has been scaled by MC30.

Table 3.3.3.1: Return code

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	-99	6	6	-99
AUG2DC.mat	-99	6	6	-99
AUG3D.mat	6	-2	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0

Table 3.3.3.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	0	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	0	0	0	0
c-55.RSA	0	0	0	0
c-58.RSA	0	-99	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	-99	-99	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	-99	0	0
c-70.RSA	0	-99	-99	0
c-71.RSA	0	-99	-99	-99
c-72.RSA	0	0	-99	0
CONT-201.RSA	0	0	0	0
CONT-300.RSA	0	0	0	0
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	6	-99	-99
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	6	6	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	0	0	0
NCVXQP3.rsa	0	-99	-99	0
NCVXQP5.rsa	0	0	0	0
NCVXQP7.rsa	-99	-99	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-99	-2	-2
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0

Table 3.3.3.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0
vibrobox.RSA	0	0	0	0

Table 3.3.3.2: Total time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	11.540	2.926	0.477	0.572
A2NNSNSL.rsa	12.397	2.769	0.487	0.644
A5ESINDL.rsa	5.035	1.947	0.294	0.371
AUG2D.mat	–	2789.160	312.776	–
AUG2DC.mat	–	3692.230	461.590	–
AUG3D.mat	1036.692	–	9927.226	996.858
AUG3DCQP.mat	1.294	14.027	8.684	1.305
bcsstk35.RSA	2.422	3.340	2.546	2.430
bcsstk37.RSA	13.700	15.856	15.240	13.834
bcsstk39.RSA	6.504	8.637	8.625	6.427
BLOCKQP1.rsa	27.994	13.130	0.629	0.781
BLOWEYA.rsa	1.748	0.754	0.150	0.189
bmw3_2.rsa	263.244	169.319	298.104	294.969
BOYD1.RSA	176.368	136.422	25.758	58.408
BOYD2.RSA	1395.565	172.174	2.278	5.784
BRAINPC2.rsa	1.621	0.633	3.304	1.765
BRATU3D.RSA	155.162	237.114	206.624	155.048
c-55.RSA	230.052	957.506	3147.368	423.159
c-58.RSA	188.430	–	3052.755	273.968
c-59.RSA	328.134	2436.417	3029.563	1316.922
c-62.RSA	1372.739	–	–	2818.841
c-63.RSA	118.837	1961.604	2280.331	191.435
c-68.RSA	347.020	2154.770	2554.625	827.119
c-69.RSA	145.266	–	3368.783	211.677
c-70.RSA	514.132	–	–	558.671
c-71.RSA	3332.795	–	–	–
c-72.RSA	251.214	2528.997	–	420.672
CONT-201.RSA	19.156	15.027	27.814	19.204
CONT-300.RSA	80.726	56.119	108.711	80.222
copter2.rsa	31.821	23.632	48.774	31.865
crystk02.RSA	12.025	6.173	10.827	12.093
crystk03.RSA	24.715	16.531	38.619	24.705
DARCY003.rsa	7.432	18.809	7.124	7.819
dawson5.rsa	4.644	6.105	5.569	4.675
DIXMAANL.rsa	0.486	1.417	0.365	0.501
DTOC.mat	–	23.020	–	–
D_PRETOK.rsa	62.392	25.660	132.980	62.313
HELM2D03.rsa	39.054	31.500	46.501	39.247
HELM3D01.rsa	20.197	14.065	29.570	20.204

Table 3.3.3.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
K1_SAN.rsa	4.610	4.791	11.113	4.633
LINVERSE.rsa	0.061	0.220	0.051	0.061
mario001.rsa	0.446	1.299	0.437	0.472
mario002.rsa	7.420	18.737	7.137	7.773
NCVXBQP1.rsa	9.229	4.243	13.283	9.365
NCVXQP1.mat	101.909	151.802	1110.410	102.099
NCVXQP3.rsa	1982.227	–	–	1977.718
NCVXQP5.rsa	421.717	244.851	1503.870	421.691
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1.023	1.259	3.417	1.032
olesnik0.rsa	6.909	6.771	12.852	6.970
qa8fk.RSA	180.631	48.747	235.382	180.185
SIT100.rsa	4.262	1.902	3.681	4.259
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	0.170	0.432	0.142	0.161
stokes128.mat	1.849	3.924	2.625	1.867
stokes64.mat	0.334	0.752	0.429	0.340
stokes64s.mat	0.342	0.752	0.423	0.336
tuma1.mat	0.423	0.828	0.591	0.425
tuma2.mat	0.168	0.390	0.229	0.172
TURON_M.rsa	46.074	23.848	80.114	48.948
vibrobox.RSA	15.917	21.837	20.953	15.976

Table 3.3.3.3: Analyse time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.209	2.619	0.164	0.255
A2NNSNSL.rsa	11.158	2.476	0.183	0.337
A5ESINDL.rsa	4.278	1.762	0.110	0.169
AUG2D.mat	–	0.708	0.043	–
AUG2DC.mat	–	0.723	0.044	–
AUG3D.mat	0.075	–	0.054	0.085
AUG3DCQP.mat	0.121	1.324	0.096	0.136
bcsstk35.RSA	0.327	0.784	0.355	0.369
bcsstk37.RSA	0.266	0.784	0.309	0.282
bcsstk39.RSA	0.565	1.261	0.736	0.524
BLOCKQP1.rsa	27.689	12.574	0.207	0.368
BLOWEYA.rsa	1.642	0.653	0.051	0.082
bmw3_2.rsa	2.764	8.819	4.460	3.160
BOYD1.RSA	107.974	135.856	25.114	57.750
BOYD2.RSA	687.504	170.883	0.975	4.410
BRAINPC2.rsa	1.089	0.458	0.050	0.083
BRATU3D.RSA	0.195	1.280	0.427	0.221
c-55.RSA	0.389	2.000	0.331	0.837
c-58.RSA	0.662	–	0.224	0.789
c-59.RSA	0.435	2.628	0.264	1.158
c-62.RSA	0.694	–	–	1.300

Table 3.3.3.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
c-63.RSA	0.364	2.434	0.215	0.625
c-68.RSA	0.689	3.715	0.463	2.499
c-69.RSA	0.580	—	0.314	0.675
c-70.RSA	0.613	—	—	0.792
c-71.RSA	1.123	—	—	—
c-72.RSA	0.727	4.347	—	0.955
CONT-201.RSA	0.360	2.600	0.322	0.406
CONT-300.RSA	0.897	6.436	0.946	1.002
copter2.rsa	0.682	3.574	1.184	0.775
crystk02.RSA	0.199	0.700	0.360	0.207
crystk03.RSA	0.410	1.407	0.938	0.429
DARCY003.rsa	2.616	14.966	1.467	2.967
dawson5.rsa	0.452	3.124	0.415	0.488
DIXMAANL.rsa	0.226	1.152	0.128	0.245
DTOC.mat	—	0.322	—	—
D_PRETOK.rsa	1.001	9.308	2.320	1.083
HELM2D03.rsa	3.183	15.606	3.040	3.470
HELM3D01.rsa	0.435	1.883	0.554	0.491
K1_SAN.rsa	0.327	2.820	0.455	0.346
LINVERSE.rsa	0.028	0.177	0.021	0.029
mario001.rsa	0.145	1.024	0.097	0.171
mario002.rsa	2.607	14.891	1.484	2.921
NCVXBQP1.rsa	0.460	1.732	0.578	0.531
NCVXQP1.mat	0.141	0.479	0.135	0.161
NCVXQP3.rsa	2.056	—	—	2.466
NCVXQP5.rsa	1.166	3.459	2.886	1.382
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	0.061	0.387	0.035	0.069
olesnik0.rsa	0.445	3.802	0.584	0.496
qa8fk.RSA	1.042	6.152	3.274	1.164
SIT100.rsa	0.043	0.314	0.050	0.048
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.078	0.311	0.058	0.075
stokes128.mat	0.244	2.140	0.250	0.252
stokes64.mat	0.051	0.427	0.048	0.058
stokes64s.mat	0.051	0.426	0.048	0.054
tuma1.mat	0.067	0.573	0.062	0.075
tuma2.mat	0.038	0.275	0.031	0.042
TURON_M.rsa	1.073	9.990	2.461	1.313
vibrobox.RSA	0.181	0.923	0.162	0.198

Table 3.3.3.4: Factorize time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.270	0.266	0.276	0.279
A2NNSNSL.rsa	1.193	0.253	0.265	0.268
A5ESINDL.rsa	0.726	0.159	0.159	0.178

Table 3.3.3.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
AUG2D.mat	–	2788.272	312.560	–
AUG2DC.mat	–	3691.324	461.344	–
AUG3D.mat	1036.096	–	9926.525	996.280
AUG3DCQP.mat	1.136	12.658	8.546	1.133
bcsstk35.RSA	1.988	2.438	2.093	1.966
bcsstk37.RSA	13.282	14.912	14.756	13.392
bcsstk39.RSA	5.691	7.130	7.639	5.681
BLOCKQP1.rsa	0.276	0.517	0.388	0.381
BLOWEYA.rsa	0.096	0.090	0.089	0.097
bmw3_2.rsa	258.781	159.016	291.486	288.961
BOYD1.RSA	67.911	0.504	0.581	0.595
BOYD2.RSA	706.893	1.071	1.077	1.144
BRAINPC2.rsa	0.514	0.162	3.222	1.656
BRATU3D.RSA	154.569	235.478	205.725	154.440
c-55.RSA	229.408	955.228	3146.625	421.953
c-58.RSA	187.563	–	3052.136	272.979
c-59.RSA	327.380	2433.398	3028.961	1315.379
c-62.RSA	1370.948	–	–	2816.357
c-63.RSA	118.239	1958.856	2279.821	190.498
c-68.RSA	346.015	2150.580	2553.804	824.299
c-69.RSA	144.411	–	3368.132	210.697
c-70.RSA	513.139	–	–	557.381
c-71.RSA	3330.452	–	–	–
c-72.RSA	250.155	2524.226	–	419.363
CONT-201.RSA	18.505	12.187	27.162	18.507
CONT-300.RSA	79.049	49.064	106.897	78.439
copter2.rsa	30.766	19.776	47.139	30.723
crystk02.RSA	11.678	5.370	10.326	11.742
crystk03.RSA	24.022	14.893	37.329	23.993
DARCY003.rsa	4.437	3.479	5.257	4.471
dawson5.rsa	4.046	2.849	4.996	4.043
DIXMAANL.rsa	0.230	0.231	0.208	0.224
DTOC.mat	–	22.683	–	–
D_PRETOK.rsa	60.573	15.854	129.513	60.429
HELM2D03.rsa	34.918	15.155	42.428	34.828
HELM3D01.rsa	19.572	12.031	28.799	19.523
K1_SAN.rsa	4.128	1.857	10.434	4.131
LINVERSE.rsa	0.028	0.038	0.026	0.028
mario001.rsa	0.275	0.250	0.314	0.276
mario002.rsa	4.436	3.484	5.255	4.473
NCVXBQP1.rsa	8.640	2.422	12.544	8.705
NCVXQP1.mat	101.537	151.178	1109.919	101.694
NCVXQP3.rsa	1978.016	–	–	1973.096
NCVXQP5.rsa	419.615	240.895	1499.743	419.376
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.944	0.859	3.361	0.944
olesnik0.rsa	6.251	2.811	11.990	6.248
qa8fk.RSA	178.615	42.045	230.880	178.048

Table 3.3.3.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
SIT100.rsa	4.175	1.560	3.588	4.167
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.077	0.106	0.073	0.075
stokes128.mat	1.511	1.683	2.267	1.520
stokes64.mat	0.268	0.306	0.361	0.267
stokes64s.mat	0.271	0.307	0.356	0.267
tuma1.mat	0.337	0.237	0.505	0.331
tuma2.mat	0.122	0.107	0.189	0.123
TURON_M.rsa	44.294	13.354	76.628	46.761
vibrobox.RSA	15.648	20.808	20.692	15.691

Table 3.3.3.5: Solution time given factors (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0.061	0.041	0.037	0.038
A2NNSNSL.rsa	0.047	0.040	0.038	0.039
A5ESINDL.rsa	0.031	0.026	0.024	0.024
AUG2D.mat	—	0.181	0.173	—
AUG2DC.mat	—	0.184	0.202	—
AUG3D.mat	0.520	—	0.646	0.493
AUG3DCQP.mat	0.037	0.045	0.043	0.036
bcsstk35.RSA	0.107	0.118	0.099	0.096
bcsstk37.RSA	0.151	0.160	0.175	0.160
bcsstk39.RSA	0.248	0.246	0.250	0.222
BLOCKQP1.rsa	0.028	0.039	0.033	0.032
BLOWEYA.rsa	0.011	0.012	0.011	0.011
bmw3_2.rsa	1.699	1.484	2.157	2.847
BOYD1.RSA	0.483	0.062	0.062	0.062
BOYD2.RSA	1.167	0.221	0.225	0.230
BRAINPC2.rsa	0.018	0.014	0.032	0.025
BRATU3D.RSA	0.397	0.357	0.471	0.387
c-55.RSA	0.255	0.278	0.412	0.369
c-58.RSA	0.205	—	0.394	0.200
c-59.RSA	0.319	0.391	0.339	0.386
c-62.RSA	1.097	—	—	1.184
c-63.RSA	0.233	0.313	0.295	0.312
c-68.RSA	0.315	0.475	0.358	0.321
c-69.RSA	0.275	—	0.337	0.305
c-70.RSA	0.381	—	—	0.499
c-71.RSA	1.220	—	—	—
c-72.RSA	0.332	0.424	—	0.354
CONT-201.RSA	0.291	0.240	0.330	0.291
CONT-300.RSA	0.780	0.620	0.868	0.781
copter2.rsa	0.372	0.282	0.451	0.368
crystk02.RSA	0.148	0.103	0.141	0.143
crystk03.RSA	0.283	0.231	0.352	0.283
DARCY003.rsa	0.380	0.364	0.400	0.381

Table 3.3.3.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
dawson5.rsa	0.145	0.132	0.158	0.144
DIXMAANL.rsa	0.029	0.034	0.029	0.031
DTOC.mat	–	0.015	–	–
D_PRETOK.rsa	0.818	0.498	1.147	0.800
HELM2D03.rsa	0.953	0.739	1.033	0.950
HELM3D01.rsa	0.190	0.151	0.217	0.190
K1_SAN.rsa	0.154	0.114	0.224	0.156
LINVERSE.rsa	0.004	0.005	0.003	0.003
mario001.rsa	0.025	0.025	0.026	0.025
mario002.rsa	0.377	0.362	0.398	0.379
NCVXBQP1.rsa	0.130	0.088	0.162	0.129
NCVXQP1.mat	0.231	0.144	0.356	0.244
NCVXQP3.rsa	2.151	–	–	2.155
NCVXQP5.rsa	0.936	0.497	1.241	0.933
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	0.019	0.013	0.020	0.019
olesnik0.rsa	0.213	0.159	0.278	0.225
qa8fk.RSA	0.974	0.550	1.229	0.973
SIT100.rsa	0.044	0.028	0.044	0.045
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.015	0.015	0.012	0.011
stokes128.mat	0.094	0.101	0.108	0.096
stokes64.mat	0.015	0.019	0.020	0.015
stokes64s.mat	0.020	0.020	0.019	0.015
tuma1.mat	0.019	0.018	0.024	0.019
tuma2.mat	0.008	0.008	0.009	0.007
TURON_M.rsa	0.708	0.504	1.025	0.874
vibrobox.RSA	0.088	0.105	0.099	0.087

Table 3.3.3.6: Minimum memory required (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.5E+01	1.5E+01	1.4E+01	1.4E+01
A2NNSNSL.rsa	1.5E+01	1.4E+01	1.4E+01	1.4E+01
A5ESINDL.rsa	1.1E+01	9.5E+00	9.5E+00	9.7E+00
AUG2D.mat	–	1.6E+03	1.6E+03	–
AUG2DC.mat	–	1.7E+03	1.8E+03	–
AUG3D.mat	2.6E+03	–	2.9E+03	2.6E+03
AUG3DCQP.mat	1.9E+01	1.9E+01	1.9E+01	1.9E+01
bcsstk35.RSA	4.7E+01	4.9E+01	4.8E+01	4.7E+01
bcsstk37.RSA	6.1E+01	8.7E+01	6.7E+01	6.1E+01
bcsstk39.RSA	8.9E+01	9.6E+01	9.9E+01	8.9E+01
BLOCKQP1.rsa	1.6E+01	3.0E+01	2.7E+01	2.7E+01
BLOWEYA.rsa	5.1E+00	5.2E+00	5.1E+00	5.1E+00
bmw3.2.rsa	9.1E+02	6.7E+02	9.1E+02	9.1E+02
BOYD1.RSA	2.5E+02	4.1E+01	4.4E+01	4.3E+01
BOYD2.RSA	1.5E+03	6.1E+01	6.2E+01	6.2E+01

Table 3.3.3.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BRAINPC2.rsa	7.3E+00	6.6E+00	1.1E+01	1.0E+01
BRATU3D.RSA	2.9E+02	1.4E+02	3.2E+02	2.9E+02
c-55.RSA	3.1E+02	1.6E+02	2.4E+02	4.1E+02
c-58.RSA	3.0E+02	—	2.2E+02	3.0E+02
c-59.RSA	2.9E+02	2.0E+02	2.1E+02	2.8E+02
c-62.RSA	9.5E+02	—	—	1.3E+03
c-63.RSA	2.2E+02	2.0E+02	2.0E+02	2.6E+02
c-68.RSA	3.5E+02	2.0E+02	2.4E+02	3.3E+02
c-69.RSA	2.8E+02	—	2.8E+02	3.1E+02
c-70.RSA	4.9E+02	—	—	6.1E+02
c-71.RSA	1.6E+03	—	—	—
c-72.RSA	3.8E+02	3.2E+02	—	4.3E+02
CONT-201.RSA	1.1E+02	8.2E+01	1.2E+02	1.1E+02
CONT-300.RSA	3.1E+02	2.1E+02	3.3E+02	3.1E+02
copter2.rsa	1.6E+02	1.1E+02	2.0E+02	1.6E+02
crystk02.RSA	8.5E+01	5.4E+01	7.5E+01	8.5E+01
crystk03.RSA	1.5E+02	1.2E+02	1.8E+02	1.5E+02
DARCY003.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
dawson5.rsa	6.3E+01	5.3E+01	6.6E+01	6.3E+01
DIXMAANL.rsa	1.2E+01	1.2E+01	1.1E+01	1.2E+01
DTOC.mat	—	3.6E+02	—	—
D_PRETOK.rsa	3.4E+02	1.7E+02	4.8E+02	3.4E+02
HELM2D03.rsa	3.3E+02	2.3E+02	3.6E+02	3.3E+02
HELM3D01.rsa	1.2E+02	6.4E+01	1.1E+02	1.2E+02
K1_SAN.rsa	5.7E+01	3.8E+01	8.7E+01	5.7E+01
LINVERSE.rsa	2.7E+00	3.0E+00	2.7E+00	2.7E+00
mario001.rsa	9.6E+00	9.5E+00	1.0E+01	9.6E+00
mario002.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
NCVXBQP1.rsa	7.5E+01	3.1E+01	8.4E+01	7.5E+01
NCVXQP1.mat	2.7E+02	7.1E+01	2.8E+02	2.7E+02
NCVXQP3.rsa	2.1E+03	—	—	2.1E+03
NCVXQP5.rsa	8.2E+02	1.7E+02	6.0E+02	8.2E+02
NCVXQP7.rsa	—	—	—	—
NCVXQP9.mat	1.2E+01	5.4E+00	1.2E+01	1.2E+01
olesnik0.rsa	8.1E+01	5.3E+01	1.1E+02	8.1E+01
qa8fk.RSA	4.7E+02	2.3E+02	5.4E+02	4.7E+02
SIT100.rsa	2.5E+01	1.2E+01	2.2E+01	2.5E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	6.0E+00	6.8E+00	6.0E+00	6.0E+00
stokes128.mat	3.4E+01	3.5E+01	4.1E+01	3.4E+01
stokes64.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
stokes64s.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
tuma1.mat	8.8E+00	7.5E+00	1.1E+01	8.8E+00
tuma2.mat	4.1E+00	3.8E+00	5.3E+00	4.1E+00
TURON_M.rsa	2.8E+02	1.5E+02	3.6E+02	2.8E+02
vibrobox.RSA	8.1E+01	8.1E+01	8.4E+01	8.1E+01

Table 3.3.3.7: Actual memory used (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	1.5E+01	2.2E+01	1.7E+01	1.6E+01
A2NNSNSL.rsa	1.5E+01	2.1E+01	1.6E+01	1.5E+01
A5ESINDL.rsa	1.0E+01	1.5E+01	9.4E+00	1.0E+01
AUG2D.mat	–	2.3E+03	2.5E+03	–
AUG2DC.mat	–	2.2E+03	2.3E+03	–
AUG3D.mat	3.1E+03	–	3.4E+03	3.1E+03
AUG3DCQP.mat	2.0E+01	2.1E+01	2.0E+01	2.0E+01
bcsstk35.RSA	5.4E+01	5.8E+01	5.4E+01	5.4E+01
bcsstk37.RSA	6.9E+01	9.3E+01	7.6E+01	6.9E+01
bcsstk39.RSA	1.0E+02	1.1E+02	1.1E+02	1.0E+02
BLOCKQP1.rsa	1.9E+01	3.7E+01	3.0E+01	3.0E+01
BLOWEYA.rsa	5.7E+00	8.7E+00	6.2E+00	5.9E+00
bmw3_2.rsa	1.0E+03	7.6E+02	9.8E+02	1.0E+03
BOYD1.RSA	2.6E+02	5.3E+01	5.1E+01	5.0E+01
BOYD2.RSA	1.5E+03	9.9E+01	6.0E+01	6.5E+01
BRAINPC2.rsa	8.4E+00	9.1E+00	1.5E+01	1.4E+01
BRATU3D.RSA	3.0E+02	1.4E+02	3.5E+02	3.0E+02
c-55.RSA	3.1E+02	2.6E+02	4.5E+02	4.3E+02
c-58.RSA	3.2E+02	–	2.5E+02	3.1E+02
c-59.RSA	2.9E+02	3.2E+02	2.3E+02	3.0E+02
c-62.RSA	1.0E+03	–	–	1.3E+03
c-63.RSA	2.3E+02	2.1E+02	3.4E+02	2.6E+02
c-68.RSA	3.4E+02	2.2E+02	2.6E+02	3.5E+02
c-69.RSA	2.9E+02	–	3.1E+02	3.1E+02
c-70.RSA	5.0E+02	–	–	6.5E+02
c-71.RSA	1.6E+03	–	–	–
c-72.RSA	3.9E+02	4.9E+02	–	4.3E+02
CONT-201.RSA	1.2E+02	9.1E+01	1.3E+02	1.2E+02
CONT-300.RSA	3.3E+02	2.3E+02	3.4E+02	3.3E+02
copter2.rsa	1.8E+02	1.2E+02	2.1E+02	1.8E+02
crystk02.RSA	9.7E+01	6.0E+01	8.0E+01	9.7E+01
crystk03.RSA	1.7E+02	1.3E+02	2.0E+02	1.7E+02
DARCY003.rsa	1.1E+02	1.3E+02	1.3E+02	1.2E+02
dawson5.rsa	7.0E+01	6.0E+01	7.3E+01	7.0E+01
DIXMAANL.rsa	1.3E+01	1.6E+01	1.3E+01	1.3E+01
DTOC.mat	–	4.1E+02	–	–
D_PRETOK.rsa	3.6E+02	1.9E+02	4.9E+02	3.7E+02
HELM2D03.rsa	3.5E+02	2.5E+02	3.7E+02	3.5E+02
HELM3D01.rsa	1.3E+02	7.1E+01	1.2E+02	1.3E+02
K1_SAN.rsa	6.4E+01	4.1E+01	9.4E+01	6.4E+01
LINVERSE.rsa	2.9E+00	4.5E+00	2.7E+00	3.0E+00
mario001.rsa	1.0E+01	1.2E+01	1.1E+01	1.0E+01
mario002.rsa	1.1E+02	1.3E+02	1.3E+02	1.2E+02
NCVXBQP1.rsa	7.8E+01	4.0E+01	8.8E+01	7.8E+01
NCVXQP1.mat	2.8E+02	1.2E+02	5.1E+02	2.8E+02
NCVXQP3.rsa	2.2E+03	–	–	2.2E+03
NCVXQP5.rsa	8.5E+02	1.9E+02	7.0E+02	8.5E+02
NCVXQP7.rsa	–	–	–	–

Table 3.3.3.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	1.3E+01	5.6E+00	1.6E+01	1.3E+01
olesnik0.rsa	9.4E+01	5.6E+01	1.2E+02	9.5E+01
qa8fk.RSA	5.3E+02	2.6E+02	5.9E+02	5.3E+02
SIT100.rsa	2.6E+01	1.2E+01	2.5E+01	2.6E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	6.4E+00	9.8E+00	6.3E+00	6.5E+00
stokes128.mat	3.5E+01	3.8E+01	4.3E+01	3.5E+01
stokes64.mat	8.1E+00	9.0E+00	9.6E+00	8.1E+00
stokes64s.mat	8.1E+00	9.0E+00	9.6E+00	8.1E+00
tuma1.mat	9.1E+00	8.5E+00	1.2E+01	9.2E+00
tuma2.mat	4.3E+00	4.6E+00	5.8E+00	4.4E+00
TURON_M.rsa	2.8E+02	1.6E+02	4.1E+02	2.9E+02
vibrobox.RSA	8.5E+01	8.6E+01	8.7E+01	8.5E+01

Table 3.3.3.8: Number of integers used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	702448	487817	499452	509533
A2NNSNSL.rsa	661064	482756	476097	495688
A5ESINDL.rsa	488425	314914	333795	344496
AUG2D.mat	—	1696654	350480	—
AUG2DC.mat	—	1864732	383853	—
AUG3D.mat	319170	—	2684432	319170
AUG3DCQP.mat	237508	912742	499219	237508
bcsstk35.RSA	227844	258949	231075	227844
bcsstk37.RSA	218593	257610	222425	218593
bcsstk39.RSA	395732	444085	410448	395732
BLOCKQP1.rsa	399890	320025	400023	400020
BLOWEYA.rsa	140001	146564	130006	140002
bmw3.2.rsa	2119630	2437911	2235064	2119630
BOYD1.RSA	483501	838806	838793	838734
BOYD2.RSA	2140797	2195779	2195775	2195771
BRAINPC2.rsa	245916	137007	683404	386535
BRATU3D.RSA	397378	1578475	419895	397378
c-55.RSA	380202	2735691	4442741	547243
c-58.RSA	556711	—	2686918	738155
c-59.RSA	433119	2944489	2930941	1907308
c-62.RSA	550342	—	—	744387
c-63.RSA	369354	2167355	2137382	696987
c-68.RSA	642100	4288791	4819614	1801507
c-69.RSA	501030	—	2648174	579303
c-70.RSA	534062	—	—	645888
c-71.RSA	906986	—	—	—
c-72.RSA	645995	3013721	—	834226
CONT-201.RSA	644769	852967	676519	644769
CONT-300.RSA	1473774	1964352	1548605	1473774
copter2.rsa	837915	979250	879549	837915

Table 3.3.3.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk02.RSA	173257	183383	182559	173257
crystk03.RSA	317983	349017	330965	317983
DARCY003.rsa	1937789	2005751	1962891	1937789
dawson5.rsa	562121	615054	580205	562121
DIXMAANL.rsa	457012	480808	389957	457012
DTOC.mat	–	189419	–	–
D_PRETOK.rsa	1373448	1390480	1465108	1373448
HELM2D03.rsa	3744078	3897412	3825244	3744078
HELM3D01.rsa	480597	611040	556252	480597
K1_SAN.rsa	455313	456526	490047	455313
LINVERSE.rsa	42005	59337	42130	42005
mario001.rsa	186996	193950	189717	186996
mario002.rsa	1937789	2005751	1962891	1937789
NCVXBQP1.rsa	516654	517565	533429	516654
NCVXQP1.mat	259145	675322	1096539	259145
NCVXQP3.rsa	2195023	–	–	2195023
NCVXQP5.rsa	1243266	2219269	3032630	1243266
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	99695	123736	125514	99695
olesnik0.rsa	596772	600395	636339	596772
qa8fk.RSA	1861292	1119350	1556234	1861292
SIT100.rsa	88922	84763	87139	88922
SPARSINE.rsa	–	–	–	–
SPMSRTL5.rsa	129868	150725	129795	129868
stokes128.mat	306893	398853	317926	306893
stokes64.mat	76565	99199	78726	76565
stokes64s.mat	76575	99217	78760	76575
tuma1.mat	123510	127674	128046	123510
tuma2.mat	67681	71029	70928	67681
TURON_M.rsa	1368028	1365619	1436742	1368028
vibrobox.RSA	205562	276195	209958	205562

Table 3.3.3.9: Number of reals used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	546626	359368	342857	350925
A2NNSNSL.rsa	512916	333722	327194	337918
A5ESINDL.rsa	376261	232346	216978	228667
AUG2D.mat	–	6114686	6521828	–
AUG2DC.mat	–	6191556	7704686	–
AUG3D.mat	20253212	–	18661584	20253212
AUG3DCQP.mat	958088	1011954	1003495	958088
bcsstk35.RSA	2844652	3163067	2978929	2844652
bcsstk37.RSA	4725782	5588786	5298795	4725782
bcsstk39.RSA	6688229	7536133	7852736	6688229
BLOCKQP1.rsa	380113	780068	380068	380068
BLOWEYA.rsa	140008	160945	130009	140009
bmw3.2.rsa	68074811	56303361	73730133	68074811

Table 3.3.3.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD1.RSA	26852345	652406	652414	652411
BOYD2.RSA	61603776	1263167	1263167	1263171
BRAINPC2.rsa	352390	313157	630332	630648
BRATU3D.RSA	18209670	11509404	20816990	18209670
c-55.RSA	12830695	9638730	13510563	18640281
c-58.RSA	10346733	–	9691877	9973786
c-59.RSA	11389619	11380910	10693744	14058641
c-62.RSA	43455765	–	–	57209703
c-63.RSA	9407245	10199857	9480068	10942204
c-68.RSA	12491913	12856927	11443885	13079091
c-69.RSA	12893938	–	13389041	14375354
c-70.RSA	19631984	–	–	25610782
c-71.RSA	65409241	–	–	–
c-72.RSA	15773597	15432962	–	17220555
CONT-201.RSA	10433562	7786677	12147659	10433562
CONT-300.RSA	29257997	20717832	32903984	29257997
copter2.rsa	14143168	9700783	17236806	14143168
crystk02.RSA	6098264	4194267	5856135	6098264
crystk03.RSA	11904222	9488939	14710433	11904222
DARCY003.rsa	6966444	6393226	7667322	6966444
dawson5.rsa	4627806	4003127	5214258	4627806
DIXMAANL.rsa	340501	383241	350117	340501
DTOC.mat	–	333641	–	–
D.PRETOK.rsa	30099198	15669087	45155834	30099198
HELM2D03.rsa	28015811	18900741	31686835	28015811
HELM3D01.rsa	7632320	5084482	8148291	7632320
K1.SAN.rsa	4810524	3078790	7767057	4810524
LINVERSE.rsa	54491	92889	54259	54491
mario001.rsa	530558	523987	584643	530558
mario002.rsa	6966444	6393226	7667322	6966444
NCVXBQP1.rsa	4145233	2041835	5382112	4145233
NCVXQP1.mat	12208080	4589394	12792244	12208080
NCVXQP3.rsa	105202425	–	–	105202425
NCVXQP5.rsa	42669203	13760462	40939341	42669203
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	606605	359697	634057	606605
olesnik0.rsa	6694758	4352780	9690010	6694758
qa8fk.RSA	40901710	21607991	51388343	40901710
SIT100.rsa	1793879	1031979	1758470	1793879
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	130233	229299	130243	130233
stokes128.mat	2714396	2908653	3362745	2714396
stokes64.mat	557892	608953	664992	557892
stokes64s.mat	558038	609184	665550	558038
tuma1.mat	544908	448931	698745	544908
tuma2.mat	231941	214991	313264	231941
TURON_M.rsa	25219746	13557930	34380342	25219746
vibrobox.RSA	3970238	4552975	4399406	3970238

Table 3.3.3.10: Total number of integers used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	702611	532804	544389	554602
A2NNSNSL.rsa	661224	525678	519020	538816
A5ESINDL.rsa	488498	339931	358778	369595
AUG2D.mat	–	1677076	331018	–
AUG2DC.mat	–	1844348	363477	–
AUG3D.mat	296000	–	2659181	296000
AUG3DCQP.mat	239568	912775	499288	239568
bcsstk35.RSA	770442	770442	770442	770442
bcsstk37.RSA	608748	608748	608748	608748
bcsstk39.RSA	1114810	1114810	1114810	1114810
BLOCKQP1.rsa	420062	560062	640053	640053
BLOWEYA.rsa	150024	146640	150024	150024
bmw3.2.rsa	5985363	5985363	5985363	5985363
BOYD1.RSA	838820	1238226	1332441	1312064
BOYD2.RSA	2288358	2382983	2411473	2426941
BRAINPC2.rsa	246061	138236	683530	386674
BRATU3D.RSA	404692	1578476	426066	404692
c-55.RSA	397645	2735723	4446196	575422
c-58.RSA	575990	–	2691943	761905
c-59.RSA	446768	2946760	2933394	1931345
c-62.RSA	578074	–	–	795051
c-63.RSA	376926	2171931	2142919	703996
c-68.RSA	658505	4288809	4822281	1849122
c-69.RSA	508597	–	2651757	587723
c-70.RSA	549104	–	–	663466
c-71.RSA	939068	–	–	–
c-72.RSA	654734	3017363	–	849479
CONT-201.RSA	647720	854155	679121	647720
CONT-300.RSA	1478839	1966315	1552823	1478839
copter2.rsa	862536	982725	890741	862536
crystk02.RSA	505244	505244	505244	505244
crystk03.RSA	912638	912638	912638	912638
DARCY003.rsa	1939720	2006892	1964645	1939720
dawson5.rsa	582864	619658	586937	582864
DIXMAANL.rsa	457037	480859	389977	457037
DTOC.mat	–	179429	–	–
D_PRETOK.rsa	1382447	1392771	1472921	1382447
HELM2D03.rsa	3752224	3901018	3831360	3752224
HELM3D01.rsa	494622	615940	561140	494622
K1_SAN.rsa	458077	457700	493623	458077
LINVERSE.rsa	71992	72008	71992	71992
mario001.rsa	187600	194312	190324	187600
mario002.rsa	1939720	2006892	1964645	1939720
NCVXBQP1.rsa	519047	520700	540472	519047
NCVXQP1.mat	270494	676250	1098007	270494
NCVXQP3.rsa	2231556	–	–	2231556
NCVXQP5.rsa	1270932	2220340	3033717	1270932
NCVXQP7.rsa	–	–	–	–

Table 3.3.3.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	100843	123891	126107	100843
olesnik0.rsa	600629	601676	639663	600629
qa8fk.RSA	1892539	1133613	1577613	1892539
SIT100.rsa	91206	85482	88669	91206
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	159976	159976	159977	159976
stokes128.mat	362008	400431	362008	362008
stokes64.mat	90904	99981	90904	90904
stokes64s.mat	90904	99999	90904	90904
tuma1.mat	124680	128323	129119	124680
tuma2.mat	68310	71400	71674	68310
TURON_M.rsa	1377310	1368056	1442937	1377310
vibrobox.RSA	216881	284452	219964	216881

Table 3.3.3.11: Total number of reals used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	558344	559962	528768	533520
A2NNSNSL.rsa	524004	499308	497065	506593
A5ESINDL.rsa	382086	287035	270700	287187
AUG2D.mat	—	201005184	203913793	—
AUG2DC.mat	—	216156560	221446339	—
AUG3D.mat	328977068	—	355690986	328977068
AUG3DCQP.mat	1726160	1432707	1576633	1726160
bcsstk35.RSA	3101265	3319478	3213105	3101265
bcsstk37.RSA	5482247	8661430	6228312	5482247
bcsstk39.RSA	7106639	8066085	8412126	7106639
BLOCKQP1.rsa	420242	2100227	1700210	1700221
BLOWEYA.rsa	140055	151216	140044	140056
bmw3.2.rsa	92108578	62691855	92035315	92108578
BOYD1.RSA	28411338	1805378	2101883	2030791
BOYD2.RSA	182449799	1450379	1507382	1516334
BRAINPC2.rsa	357519	323515	634790	635327
BRATU3D.RSA	35462295	16506822	39774012	35462295
c-55.RSA	37743634	17440037	27527378	50371679
c-58.RSA	35808675	—	25167349	35809419
c-59.RSA	34482120	22501897	23718096	33498465
c-62.RSA	116871875	—	—	162678000
c-63.RSA	26157865	22997939	22569741	30771849
c-68.RSA	41815566	21866130	25828706	39643705
c-69.RSA	33865035	—	32695805	37086320
c-70.RSA	60108661	—	—	74730728
c-71.RSA	193868661	—	—	—
c-72.RSA	45998239	36312656	—	51148670
CONT-201.RSA	12328963	8655855	14029208	12328963
CONT-300.RSA	35714096	22489791	37680836	35714096
copter2.rsa	18401038	11502342	23565589	18401038
crystk02.RSA	8827118	4963533	7559459	8827118

Table 3.3.3.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk03.RSA	15713960	11241066	19640568	15713960
DARCY003.rsa	7600284	6625171	8323357	7600284
dawson5.rsa	5754861	4411048	6161754	5754861
DIXMAANL.rsa	380038	383337	350133	380038
DTOC.mat	–	44086152	–	–
D_PRETOK.rsa	37919486	17192948	55289380	37919486
HELM2D03.rsa	32569973	20003852	35809219	32569973
HELM3D01.rsa	13763904	6810849	13105968	13763904
K1_SAN.rsa	5670058	3321674	9381076	5670058
LINVERSE.rsa	60021	93124	60021	60021
mario001.rsa	576095	548958	663058	576095
mario002.rsa	7600284	6625171	8323357	7600284
NCVXBQP1.rsa	8071629	2630746	9199106	8071629
NCVXQP1.mat	32926430	8297799	34152117	32926430
NCVXQP3.rsa	264146865	–	–	264146865
NCVXQP5.rsa	101169794	19072755	71849055	101169794
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	1254738	434488	1316988	1254738
olesnik0.rsa	8181749	4698204	11390154	8181749
qa8fk.RSA	55505819	25207355	64290070	55505819
SIT100.rsa	2922334	1249639	2517601	2922334
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	130102	229326	130118	130102
stokes128.mat	2946251	3095685	3809791	2946251
stokes64.mat	622493	655527	766876	622493
stokes64s.mat	622639	655758	767434	622639
tuma1.mat	697272	529281	946235	697272
tuma2.mat	286650	246844	428175	286650
TURON_M.rsa	30983766	14787343	40206097	30983766
vibrobox.RSA	9452766	9399644	9844273	9452766

Table 3.3.3.12: Norm of scaled residuals

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.2E-15	2.1E-15	3.9E-16	1.7E-15
A2NNSNSL.rsa	4.7E-16	1.0E-15	2.3E-16	5.2E-16
A5ESINDL.rsa	8.6E-16	7.6E-16	4.6E-16	1.9E-15
AUG2D.mat	–	0.0E+00	0.0E+00	–
AUG2DC.mat	–	0.0E+00	0.0E+00	–
AUG3D.mat	0.0E+00	–	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-16	1.3E-16	1.3E-16	1.3E-16
bcsstk35.RSA	1.0E-16	2.7E-16	1.0E-16	1.0E-16
bcsstk37.RSA	1.6E-15	1.7E-15	1.7E-15	1.6E-15
bcsstk39.RSA	2.6E-16	2.6E-16	2.7E-16	2.6E-16
BLOCKQP1.rsa	1.2E-12	1.2E-12	1.2E-12	1.2E-12
BLOWEYA.rsa	1.4E-13	8.2E-14	1.4E-13	1.2E-13
bmw3_2.rsa	2.7E-16	2.4E-16	4.0E-16	2.7E-16
BOYD1.RSA	3.7E-09	3.2E-09	3.3E-09	2.6E-09

Table 3.3.3.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD2.RSA	4.6E-07	6.7E-07	6.7E-07	6.8E-07
BRAINPC2.rsa	8.1E-12	6.4E-12	7.5E-12	7.9E-12
BRATU3D.RSA	3.6E-10	2.6E-10	7.0E-10	3.6E-10
c-55.RSA	4.3E-13	1.2E-13	1.2E-13	3.7E-13
c-58.RSA	3.5E-13	–	3.5E-13	3.5E-13
c-59.RSA	2.3E-13	4.7E-14	4.7E-14	1.6E-13
c-62.RSA	4.9E-13	–	–	1.0E-12
c-63.RSA	9.1E-13	7.6E-14	7.4E-13	6.8E-14
c-68.RSA	2.3E-15	2.1E-15	5.5E-15	2.0E-15
c-69.RSA	4.3E-13	–	4.3E-13	4.2E-13
c-70.RSA	2.8E-13	–	–	7.7E-14
c-71.RSA	1.5E-12	–	–	–
c-72.RSA	2.3E-13	2.4E-13	–	2.4E-13
CONT-201.RSA	1.6E-12	2.5E-12	3.3E-12	1.6E-12
CONT-300.RSA	1.8E-12	3.9E-12	3.3E-12	1.8E-12
copter2.rsa	1.7E-12	5.1E-13	1.1E-12	1.7E-12
crystk02.RSA	2.1E-15	2.2E-15	2.2E-15	2.1E-15
crystk03.RSA	2.7E-15	2.8E-15	2.8E-15	2.7E-15
DARCY003.rsa	1.4E-15	1.2E-15	1.5E-15	1.4E-15
dawson5.rsa	2.7E-13	2.1E-13	3.8E-13	2.7E-13
DIXMAANL.rsa	3.8E-16	5.4E-16	3.3E-16	3.8E-16
DTOC.mat	–	6.7E-15	–	–
D_PRETOK.rsa	3.1E-16	2.7E-16	3.4E-16	3.1E-16
HELM2D03.rsa	1.6E-12	7.1E-13	1.6E-12	1.6E-12
HELM3D01.rsa	4.1E-13	2.8E-13	4.5E-13	4.1E-13
K1_SAN.rsa	1.7E-15	1.7E-15	1.8E-15	1.7E-15
LINVERSE.rsa	1.9E-16	7.9E-16	1.6E-16	1.9E-16
mario001.rsa	9.8E-16	9.7E-16	1.2E-15	9.8E-16
mario002.rsa	1.4E-15	1.2E-15	1.5E-15	1.4E-15
NCVXBQP1.rsa	3.1E-14	7.2E-15	3.0E-14	3.1E-14
NCVXQP1.mat	4.9E-16	2.4E-16	2.8E-16	4.9E-16
NCVXQP3.rsa	3.3E-12	–	–	3.3E-12
NCVXQP5.rsa	7.7E-13	2.3E-13	5.2E-13	7.7E-13
NCVXQP7.rsa	–	–	–	–
NCVXQP9.mat	2.1E-23	2.6E-23	2.5E-23	2.1E-23
olesnik0.rsa	4.6E-16	1.2E-15	5.9E-16	4.6E-16
qa8fk.RSA	2.6E-14	2.0E-14	2.5E-14	2.6E-14
SIT100.rsa	9.0E-16	6.0E-16	7.3E-16	9.0E-16
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	2.3E-15	3.3E-15	2.2E-15	2.3E-15
stokes128.mat	1.0E-12	2.7E-13	3.9E-12	1.0E-12
stokes64.mat	1.3E-13	8.5E-14	8.1E-13	1.3E-13
stokes64s.mat	1.7E-14	5.5E-15	2.5E-14	1.7E-14
tuma1.mat	1.6E-14	2.4E-14	3.6E-14	1.6E-14
tuma2.mat	1.3E-14	1.8E-14	3.2E-14	1.3E-14
TURON_M.rsa	9.8E-16	2.0E-15	1.1E-15	9.8E-16
vibrobox.RSA	3.2E-16	3.0E-16	3.7E-16	3.2E-16

Table 3.3.3.13: Norm of scaled residuals following a single refinement

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.4E-16	6.1E-17	1.4E-16	8.8E-17
A2NNSNSL.rsa	3.3E-17	5.0E-17	1.1E-16	1.0E-16
A5ESINDL.rsa	7.2E-17	9.7E-17	6.8E-17	1.8E-16
AUG2D.mat	–	0.0E+00	0.0E+00	–
AUG2DC.mat	–	0.0E+00	0.0E+00	–
AUG3D.mat	0.0E+00	–	0.0E+00	0.0E+00
AUG3DCQP.mat	5.4E-17	5.2E-17	4.9E-17	5.4E-17
bcsstk35.RSA	4.3E-16	3.2E-16	1.2E-16	4.3E-16
bcsstk37.RSA	9.3E-16	9.5E-16	9.4E-16	9.3E-16
bcsstk39.RSA	2.2E-16	2.2E-16	2.2E-16	2.2E-16
BLOCKQP1.rsa	4.9E-14	2.4E-15	2.4E-15	2.4E-15
BLOWEYA.rsa	1.8E-13	1.8E-13	1.8E-13	6.0E-14
bmw3.2.rsa	2.2E-16	2.0E-16	3.1E-16	2.2E-16
BOYD1.RSA	9.4E-15	8.7E-16	8.5E-15	3.5E-15
BOYD2.RSA	2.1E-15	1.6E-15	2.5E-15	3.6E-15
BRAINPC2.rsa	6.3E-15	6.3E-15	6.7E-15	6.7E-15
BRATU3D.RSA	1.3E-15	1.3E-15	1.3E-15	1.3E-15
c-55.RSA	6.6E-16	6.7E-16	6.7E-16	6.7E-16
c-58.RSA	2.7E-15	–	2.9E-15	3.0E-15
c-59.RSA	1.0E-14	8.0E-15	1.1E-14	1.0E-14
c-62.RSA	1.0E-15	–	–	1.0E-15
c-63.RSA	4.1E-17	6.7E-17	7.6E-17	3.0E-17
c-68.RSA	1.2E-17	1.2E-17	1.2E-17	5.9E-17
c-69.RSA	1.9E-16	–	3.1E-17	1.6E-16
c-70.RSA	2.9E-16	–	–	2.9E-16
c-71.RSA	3.3E-15	–	–	–
c-72.RSA	1.6E-15	1.6E-15	–	1.6E-15
CONT-201.RSA	2.4E-15	2.4E-15	2.4E-15	2.4E-15
CONT-300.RSA	2.6E-15	2.6E-15	2.6E-15	2.6E-15
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.5E-15	1.4E-15	1.5E-15	1.5E-15
crystk03.RSA	1.8E-15	1.8E-15	1.8E-15	1.8E-15
DARCY003.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
dawson5.rsa	2.3E-16	2.3E-16	2.3E-16	2.3E-16
DIXMAANL.rsa	9.5E-17	9.6E-17	9.5E-17	9.5E-17
DTOC.mat	–	2.2E-15	–	–
D_PRETOK.rsa	9.2E-17	8.9E-17	9.2E-17	9.2E-17
HELM2D03.rsa	3.9E-15	3.9E-15	3.9E-15	3.9E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.1E-16	1.1E-16	1.1E-16	1.1E-16
LINVERSE.rsa	9.4E-17	9.6E-17	9.4E-17	9.4E-17
mario001.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
mario002.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
NCVXBQP1.rsa	1.2E-16	1.3E-16	1.3E-16	1.2E-16
NCVXQP1.mat	1.2E-16	1.4E-16	1.2E-16	1.2E-16
NCVXQP3.rsa	1.5E-16	–	–	1.5E-16
NCVXQP5.rsa	1.4E-16	1.4E-16	1.4E-16	1.4E-16
NCVXQP7.rsa	–	–	–	–

Table 3.3.3.13: Norm of scaled residuals following a single refinement (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	6.1E-24	4.6E-24	1.2E-23	6.1E-24
olesnik0.rsa	7.8E-17	8.8E-17	8.3E-17	7.8E-17
qa8fk.RSA	1.0E-14	1.0E-14	7.7E-15	1.0E-14
SIT100.rsa	2.7E-16	2.6E-16	2.5E-16	2.7E-16
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	1.3E-16	1.4E-16	1.3E-16	1.3E-16
stokes128.mat	2.5E-12	6.9E-14	1.3E-11	2.5E-12
stokes64.mat	6.5E-13	2.4E-13	5.9E-12	6.5E-13
stokes64s.mat	2.1E-14	5.5E-15	2.7E-14	2.1E-14
tuma1.mat	9.5E-17	9.5E-17	9.6E-17	9.5E-17
tuma2.mat	9.4E-17	9.6E-17	9.6E-17	9.4E-17
TURON_M.rsa	3.2E-16	1.5E-16	1.5E-16	3.2E-16
vibrobox.RSA	1.2E-16	1.2E-16	1.8E-16	1.2E-16

3.3.4 Runs with small threshold pivot tolerance on scaled matrices

Here are the results obtained with small ($u = 10^{-10}$) threshold pivoting parameter after the original matrix has been scaled by MC30.

Table 3.3.4.1: Return code

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0	0	0	0
A2NNSNSL.rsa	0	0	0	0
A5ESINDL.rsa	0	0	0	0
AUG2D.mat	-99	6	6	-99
AUG2DC.mat	-99	6	6	-99
AUG3D.mat	6	-2	6	6
AUG3DCQP.mat	0	0	0	0
bcsstk35.RSA	0	0	0	0
bcsstk37.RSA	0	0	0	0
bcsstk39.RSA	0	0	0	0
BLOCKQP1.rsa	0	0	0	0
BLOWEYA.rsa	0	0	0	0
bmw3_2.rsa	0	0	0	0
BOYD1.RSA	0	0	0	0
BOYD2.RSA	0	0	0	0
BRAINPC2.rsa	0	0	0	0
BRATU3D.RSA	-13	-13	-13	-13
c-55.RSA	0	0	0	0
c-58.RSA	0	0	0	0
c-59.RSA	0	0	0	0
c-62.RSA	0	0	0	0
c-63.RSA	0	0	0	0
c-68.RSA	0	0	0	0
c-69.RSA	0	0	0	0
c-70.RSA	0	0	0	0
c-71.RSA	0	0	0	0
c-72.RSA	0	0	0	0

Table 3.3.4.1: Return code (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
CONT-201.RSA	-13	-13	-13	-13
CONT-300.RSA	-13	-13	-13	-13
copter2.rsa	0	0	0	0
crystk02.RSA	0	0	0	0
crystk03.RSA	0	0	0	0
DARCY003.rsa	0	0	0	0
dawson5.rsa	0	0	0	0
DIXMAANL.rsa	0	0	0	0
DTOC.mat	-99	6	-99	-99
D_PRETOK.rsa	0	0	0	0
HELM2D03.rsa	0	0	0	0
HELM3D01.rsa	0	0	0	0
K1_SAN.rsa	6	6	6	6
LINVERSE.rsa	0	0	0	0
mario001.rsa	0	0	0	0
mario002.rsa	0	0	0	0
NCVXBQP1.rsa	0	0	0	0
NCVXQP1.mat	0	0	0	0
NCVXQP3.rsa	0	0	-99	0
NCVXQP5.rsa	0	0	0	0
NCVXQP7.rsa	-99	0	-99	-99
NCVXQP9.mat	0	0	0	0
olesnik0.rsa	0	0	0	0
qa8fk.RSA	0	0	0	0
SIT100.rsa	0	0	0	0
SPARSINE.rsa	-2	-99	-2	-2
SPMSRTLS.rsa	0	0	0	0
stokes128.mat	0	0	0	0
stokes64.mat	0	0	0	0
stokes64s.mat	0	0	0	0
tuma1.mat	0	0	0	0
tuma2.mat	0	0	0	0
TURON_M.rsa	0	0	0	0
vibrobox.RSA	0	0	0	0

Table 3.3.4.2: Total time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.510	2.926	0.472	0.569
A2NNSNSL.rsa	11.424	2.759	0.482	0.641
A5ESINDL.rsa	4.468	1.943	0.289	0.364
AUG2D.mat	—	2809.313	305.085	—
AUG2DC.mat	—	3719.060	458.706	—
AUG3D.mat	1026.711	—	10067.077	1002.161
AUG3DCQP.mat	1.290	13.997	8.690	1.307
bcsstk35.RSA	2.237	3.141	2.414	2.253
bcsstk37.RSA	2.458	3.810	2.753	2.488

Table 3.3.4.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
bcsstk39.RSA	6.450	8.628	8.646	6.446
BLOCKQP1.rsa	28.098	13.067	0.613	0.856
BLOWEYA.rsa	1.750	0.753	0.148	0.186
bmw3_2.rsa	122.195	87.733	169.549	136.988
BOYD1.RSA	176.586	136.980	25.761	58.617
BOYD2.RSA	1395.131	172.180	2.269	5.778
BRAINPC2.rsa	1.188	0.628	0.172	0.183
BRATU3D.RSA	—	—	—	—
c-55.RSA	18.417	160.414	519.480	42.518
c-58.RSA	18.944	140.034	136.706	40.425
c-59.RSA	15.158	210.760	218.815	216.487
c-62.RSA	55.572	524.610	1741.698	112.627
c-63.RSA	5.328	50.146	80.671	19.073
c-68.RSA	57.419	434.845	792.809	417.872
c-69.RSA	4.759	49.735	67.474	8.227
c-70.RSA	14.442	166.064	240.723	24.305
c-71.RSA	153.299	1400.713	4613.065	298.047
c-72.RSA	7.935	59.706	93.468	20.165
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	31.735	23.641	48.719	31.743
crystk02.RSA	12.022	6.120	10.783	12.063
crystk03.RSA	24.677	16.442	38.595	24.762
DARCY003.rsa	7.383	18.706	7.067	7.803
dawson5.rsa	4.649	6.115	5.567	4.684
DIXMAANL.rsa	0.487	1.405	0.365	0.517
DTOC.mat	—	14.536	—	—
D_PRETOK.rsa	46.208	23.445	82.774	46.079
HELM2D03.rsa	38.989	31.485	46.486	39.256
HELM3D01.rsa	20.105	14.068	29.601	20.140
K1_SAN.rsa	4.025	4.631	8.824	4.072
LINVERSE.rsa	0.061	0.219	0.052	0.061
mario001.rsa	0.454	1.296	0.429	0.460
mario002.rsa	7.386	18.727	7.108	7.734
NCVXBQP1.rsa	9.188	4.234	13.286	9.229
NCVXQP1.mat	22.801	31.274	149.448	22.849
NCVXQP3.rsa	1231.139	783.503	—	1249.085
NCVXQP5.rsa	355.843	205.956	1232.171	356.381
NCVXQP7.rsa	—	2325.876	—	—
NCVXQP9.mat	0.286	0.603	0.475	0.291
olesnik0.rsa	6.235	6.482	10.814	6.285
qa8fk.RSA	180.686	48.841	235.868	180.487
SIT100.rsa	1.116	0.525	0.705	1.116
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.160	0.440	0.142	0.166
stokes128.mat	1.823	3.924	2.639	1.849
stokes64.mat	0.330	0.760	0.425	0.338
stokes64s.mat	0.332	0.750	0.423	0.339

Table 3.3.4.2: Total time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
tuma1.mat	0.415	0.826	0.589	0.424
tuma2.mat	0.164	0.388	0.224	0.172
TURON_M.rsa	41.096	23.372	72.185	42.999
vibrobox.RSA	2.936	4.271	4.857	2.975

Table 3.3.4.3: Analyse time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	10.207	2.623	0.164	0.254
A2NNSNSL.rsa	11.130	2.472	0.183	0.331
A5ESINDL.rsa	4.276	1.761	0.107	0.168
AUG2D.mat	–	0.708	0.042	–
AUG2DC.mat	–	0.723	0.045	–
AUG3D.mat	0.075	–	0.054	0.086
AUG3DCQP.mat	0.121	1.320	0.096	0.136
bcsstk35.RSA	0.319	0.775	0.364	0.342
bcsstk37.RSA	0.267	0.826	0.310	0.279
bcsstk39.RSA	0.541	1.312	0.728	0.523
BLOCKQP1.rsa	27.798	12.509	0.194	0.401
BLOWEYA.rsa	1.643	0.653	0.050	0.082
bmw3_2.rsa	2.764	8.817	4.444	3.445
BOYD1.RSA	107.795	136.408	25.109	57.945
BOYD2.RSA	687.379	170.899	0.974	4.422
BRAINPC2.rsa	1.085	0.458	0.050	0.083
BRATU3D.RSA	–	–	–	–
c-55.RSA	0.378	2.010	0.331	0.836
c-58.RSA	0.661	2.176	0.251	0.826
c-59.RSA	0.484	2.627	0.280	1.162
c-62.RSA	0.686	2.799	0.702	1.278
c-63.RSA	0.372	2.431	0.224	0.624
c-68.RSA	0.690	3.666	0.464	2.498
c-69.RSA	0.581	3.835	0.315	0.674
c-70.RSA	0.607	3.915	0.407	0.797
c-71.RSA	1.125	5.259	1.425	2.136
c-72.RSA	0.732	4.371	0.394	0.945
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	0.695	3.578	1.189	0.784
crystk02.RSA	0.208	0.701	0.356	0.207
crystk03.RSA	0.409	1.403	0.934	0.440
DARCY003.rsa	2.605	14.901	1.467	2.983
dawson5.rsa	0.460	3.130	0.417	0.490
DIXMAANL.rsa	0.219	1.138	0.128	0.258
DTOC.mat	–	0.325	–	–
D_PRETOK.rsa	0.998	9.315	2.316	1.086
HELM2D03.rsa	3.145	15.597	3.030	3.465
HELM3D01.rsa	0.435	1.887	0.553	0.490

Table 3.3.4.3: Analyse time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
K1_SAN.rsa	0.311	2.818	0.456	0.352
LINVERSE.rsa	0.028	0.177	0.021	0.029
mario001.rsa	0.148	1.022	0.097	0.166
mario002.rsa	2.607	14.917	1.475	2.916
NCVXBQP1.rsa	0.465	1.732	0.574	0.535
NCVXQP1.mat	0.141	0.477	0.134	0.159
NCVXQP3.rsa	2.064	5.234	–	2.536
NCVXQP5.rsa	1.191	3.461	2.900	1.382
NCVXQP7.rsa	–	6.146	–	–
NCVXQP9.mat	0.061	0.385	0.035	0.067
olesnik0.rsa	0.446	3.803	0.602	0.494
qa8fk.RSA	1.057	6.183	3.282	1.153
SIT100.rsa	0.042	0.310	0.050	0.047
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	0.070	0.316	0.056	0.077
stokes128.mat	0.219	2.138	0.259	0.241
stokes64.mat	0.048	0.433	0.048	0.054
stokes64s.mat	0.049	0.426	0.048	0.054
tuma1.mat	0.068	0.574	0.062	0.076
tuma2.mat	0.039	0.276	0.031	0.043
TURON_M.rsa	1.050	10.088	2.409	1.244
vibrobox.RSA	0.175	0.916	0.162	0.210

Table 3.3.4.4: Factorize time (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0.265	0.262	0.270	0.277
A2NNSNSL.rsa	0.256	0.247	0.261	0.271
A5ESINDL.rsa	0.169	0.157	0.157	0.174
AUG2D.mat	–	2808.426	304.870	–
AUG2DC.mat	–	3718.153	458.457	–
AUG3D.mat	1026.128	–	10066.396	1001.583
AUG3DCQP.mat	1.132	12.632	8.552	1.135
bcsstk35.RSA	1.819	2.262	1.943	1.808
bcsstk37.RSA	2.067	2.870	2.333	2.104
bcsstk39.RSA	5.687	7.069	7.665	5.705
BLOCKQP1.rsa	0.270	0.518	0.387	0.420
BLOWEYA.rsa	0.097	0.089	0.088	0.095
bmw3_2.rsa	118.023	77.639	163.539	131.209
BOYD1.RSA	68.311	0.508	0.587	0.609
BOYD2.RSA	706.587	1.061	1.077	1.124
BRAINPC2.rsa	0.091	0.156	0.109	0.089
BRATU3D.RSA	–	–	–	–
c-55.RSA	17.922	158.295	518.979	41.526
c-58.RSA	18.209	137.763	136.372	39.527
c-59.RSA	14.581	207.997	218.402	215.166
c-62.RSA	54.593	521.586	1740.590	111.041

Table 3.3.4.4: Factorize time (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
c-63.RSA	4.866	47.615	80.344	18.347
c-68.RSA	56.545	430.958	792.125	415.166
c-69.RSA	4.087	45.795	67.047	7.443
c-70.RSA	13.701	162.012	240.152	23.338
c-71.RSA	151.714	1395.010	4610.857	295.322
c-72.RSA	7.082	55.213	92.936	19.087
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	30.667	19.781	47.076	30.592
crystk02.RSA	11.672	5.315	10.286	11.713
crystk03.RSA	23.985	14.804	37.312	24.039
DARCY003.rsa	4.397	3.443	5.202	4.434
dawson5.rsa	4.045	2.854	4.988	4.048
DIXMAANL.rsa	0.238	0.232	0.208	0.228
DTOC.mat	—	14.197	—	—
D_PRETOK.rsa	44.518	13.693	79.548	44.309
HELM2D03.rsa	34.892	15.148	42.424	34.835
HELM3D01.rsa	19.479	12.030	28.832	19.459
K1_SAN.rsa	3.572	1.704	8.174	3.577
LINVERSE.rsa	0.028	0.038	0.026	0.027
mario001.rsa	0.280	0.249	0.306	0.269
mario002.rsa	4.403	3.444	5.236	4.434
NCVXBQP1.rsa	8.595	2.414	12.549	8.565
NCVXQP1.mat	22.566	30.726	149.175	22.596
NCVXQP3.rsa	1227.351	777.378	—	1244.830
NCVXQP5.rsa	353.778	201.997	1228.125	354.124
NCVXQP7.rsa	—	2318.157	—	—
NCVXQP9.mat	0.215	0.209	0.429	0.214
olesnik0.rsa	5.593	2.528	9.963	5.595
qa8fk.RSA	178.655	42.104	231.385	178.291
SIT100.rsa	1.049	0.205	0.632	1.044
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.079	0.108	0.075	0.078
stokes128.mat	1.511	1.684	2.272	1.514
stokes64.mat	0.267	0.307	0.358	0.269
stokes64s.mat	0.268	0.305	0.356	0.270
tuma1.mat	0.328	0.235	0.502	0.329
tuma2.mat	0.118	0.104	0.184	0.122
TURON_M.rsa	39.390	12.768	68.818	41.010
vibrobox.RSA	2.705	3.294	4.625	2.709

Table 3.3.4.5: Solution time given factors (CPU seconds)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	0.037	0.041	0.038	0.038
A2NNSNSL.rsa	0.038	0.040	0.039	0.039
A5ESINDL.rsa	0.023	0.025	0.024	0.022

Table 3.3.4.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
AUG2D.mat	–	0.180	0.173	–
AUG2DC.mat	–	0.184	0.204	–
AUG3D.mat	0.508	–	0.627	0.492
AUG3DCQP.mat	0.037	0.045	0.043	0.036
bcsstk35.RSA	0.099	0.103	0.106	0.103
bcsstk37.RSA	0.123	0.114	0.110	0.104
bcsstk39.RSA	0.223	0.247	0.254	0.218
BLOCKQP1.rsa	0.029	0.039	0.031	0.035
BLOWEYA.rsa	0.011	0.012	0.011	0.010
bmw3_2.rsa	1.408	1.277	1.566	2.335
BOYD1.RSA	0.479	0.064	0.065	0.062
BOYD2.RSA	1.165	0.221	0.219	0.231
BRAINPC2.rsa	0.012	0.014	0.013	0.011
BRATU3D.RSA	–	–	–	–
c-55.RSA	0.117	0.110	0.170	0.156
c-58.RSA	0.074	0.095	0.084	0.072
c-59.RSA	0.093	0.136	0.133	0.158
c-62.RSA	0.294	0.224	0.406	0.308
c-63.RSA	0.090	0.100	0.102	0.102
c-68.RSA	0.184	0.222	0.221	0.209
c-69.RSA	0.092	0.105	0.111	0.109
c-70.RSA	0.134	0.138	0.164	0.170
c-71.RSA	0.460	0.444	0.783	0.589
c-72.RSA	0.121	0.122	0.138	0.134
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	0.373	0.282	0.454	0.368
crystk02.RSA	0.142	0.104	0.141	0.143
crystk03.RSA	0.283	0.235	0.349	0.283
DARCY003.rsa	0.382	0.362	0.398	0.386
dawson5.rsa	0.144	0.131	0.162	0.145
DIXMAANL.rsa	0.030	0.035	0.029	0.031
DTOC.mat	–	0.014	–	–
D_PRETOK.rsa	0.691	0.437	0.910	0.683
HELM2D03.rsa	0.953	0.739	1.033	0.956
HELM3D01.rsa	0.190	0.151	0.216	0.191
K1_SAN.rsa	0.142	0.109	0.194	0.142
LINVERSE.rsa	0.004	0.004	0.004	0.004
mario001.rsa	0.025	0.025	0.026	0.024
mario002.rsa	0.377	0.365	0.397	0.384
NCVXBQP1.rsa	0.129	0.088	0.163	0.129
NCVXQP1.mat	0.095	0.070	0.140	0.094
NCVXQP3.rsa	1.720	0.890	–	1.719
NCVXQP5.rsa	0.874	0.499	1.146	0.874
NCVXQP7.rsa	–	1.573	–	–
NCVXQP9.mat	0.010	0.010	0.011	0.010
olesnik0.rsa	0.195	0.150	0.249	0.196
qa8fk.RSA	0.974	0.554	1.200	1.043

Table 3.3.4.5: Solution time given factors (CPU seconds) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
SIT100.rsa	0.024	0.010	0.022	0.024
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	0.011	0.016	0.011	0.011
stokes128.mat	0.094	0.102	0.108	0.094
stokes64.mat	0.015	0.020	0.019	0.015
stokes64s.mat	0.015	0.019	0.019	0.015
tuma1.mat	0.019	0.017	0.024	0.019
tuma2.mat	0.007	0.008	0.009	0.007
TURON_M.rsa	0.656	0.516	0.958	0.745
vibrobox.RSA	0.056	0.061	0.069	0.056

Table 3.3.4.6: Minimum memory required (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSL.rsa	1.4E+01	1.4E+01	1.4E+01	1.4E+01
A2NNSNSL.rsa	1.3E+01	1.4E+01	1.4E+01	1.4E+01
A5ESINDL.rsa	9.2E+00	9.5E+00	9.4E+00	9.6E+00
AUG2D.mat	—	1.6E+03	1.6E+03	—
AUG2DC.mat	—	1.7E+03	1.8E+03	—
AUG3D.mat	2.6E+03	—	2.9E+03	2.6E+03
AUG3DCQP.mat	1.9E+01	1.9E+01	1.9E+01	1.9E+01
bcsstk35.RSA	4.6E+01	4.8E+01	4.7E+01	4.6E+01
bcsstk37.RSA	4.4E+01	4.6E+01	4.5E+01	4.4E+01
bcsstk39.RSA	8.9E+01	9.6E+01	9.9E+01	8.9E+01
BLOCKQP1.rsa	1.6E+01	3.0E+01	2.7E+01	2.7E+01
BLOWEYA.rsa	5.1E+00	5.2E+00	5.1E+00	5.1E+00
bmw3.2.rsa	7.0E+02	5.8E+02	7.5E+02	7.0E+02
BOYD1.RSA	2.5E+02	4.1E+01	4.4E+01	4.3E+01
BOYD2.RSA	1.5E+03	6.1E+01	6.2E+01	6.2E+01
BRAINPC2.rsa	5.8E+00	6.4E+00	5.8E+00	5.8E+00
BRATU3D.RSA	—	—	—	—
c-55.RSA	1.1E+02	5.2E+01	1.1E+02	1.5E+02
c-58.RSA	9.0E+01	5.4E+01	7.9E+01	1.0E+02
c-59.RSA	8.4E+01	6.7E+01	7.8E+01	1.0E+02
c-62.RSA	1.9E+02	9.7E+01	2.1E+02	3.3E+02
c-63.RSA	4.3E+01	3.7E+01	4.8E+01	5.3E+01
c-68.RSA	2.0E+02	8.7E+01	1.5E+02	2.1E+02
c-69.RSA	4.3E+01	4.5E+01	5.5E+01	5.3E+01
c-70.RSA	9.9E+01	6.6E+01	9.0E+01	1.3E+02
c-71.RSA	4.6E+02	1.9E+02	4.3E+02	8.2E+02
c-72.RSA	6.3E+01	4.9E+01	6.7E+01	8.7E+01
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	1.6E+02	1.1E+02	2.0E+02	1.6E+02
crystk02.RSA	8.5E+01	5.4E+01	7.5E+01	8.5E+01
crystk03.RSA	1.5E+02	1.2E+02	1.8E+02	1.5E+02
DARCY003.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02

Table 3.3.4.6: Minimum memory required (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
dawson5.rsa	6.3E+01	5.3E+01	6.6E+01	6.3E+01
DIXMAANL.rsa	1.2E+01	1.2E+01	1.1E+01	1.2E+01
DTOC.mat	–	3.5E+02	–	–
D_PRETOK.rsa	2.8E+02	1.5E+02	3.7E+02	2.8E+02
HELM2D03.rsa	3.3E+02	2.3E+02	3.6E+02	3.3E+02
HELM3D01.rsa	1.2E+02	6.4E+01	1.1E+02	1.2E+02
K1_SAN.rsa	5.2E+01	3.7E+01	7.6E+01	5.2E+01
LINVERSE.rsa	2.7E+00	2.9E+00	2.7E+00	2.7E+00
mario001.rsa	9.6E+00	9.5E+00	1.0E+01	9.6E+00
mario002.rsa	1.1E+02	1.0E+02	1.2E+02	1.1E+02
NCVXBQP1.rsa	7.5E+01	3.1E+01	8.4E+01	7.5E+01
NCVXQP1.mat	9.4E+01	3.1E+01	8.8E+01	9.4E+01
NCVXQP3.rsa	1.4E+03	2.9E+02	–	1.4E+03
NCVXQP5.rsa	7.3E+02	1.5E+02	5.5E+02	7.3E+02
NCVXQP7.rsa	–	4.6E+02	–	–
NCVXQP9.mat	5.2E+00	3.7E+00	5.0E+00	5.2E+00
olesnik0.rsa	7.5E+01	5.1E+01	9.6E+01	7.5E+01
qa8fk.RSA	4.7E+02	2.3E+02	5.4E+02	4.7E+02
SIT100.rsa	1.3E+01	5.1E+00	1.0E+01	1.3E+01
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	6.0E+00	6.8E+00	6.0E+00	6.0E+00
stokes128.mat	3.4E+01	3.5E+01	4.1E+01	3.4E+01
stokes64.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
stokes64s.mat	7.6E+00	7.9E+00	8.8E+00	7.6E+00
tuma1.mat	8.7E+00	7.5E+00	1.1E+01	8.7E+00
tuma2.mat	4.0E+00	3.8E+00	5.1E+00	4.0E+00
TURON_M.rsa	2.6E+02	1.5E+02	3.3E+02	2.6E+02
vibrobox.RSA	3.3E+01	3.2E+01	4.4E+01	3.3E+01

Table 3.3.4.7: Actual memory used (Mbytes)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.5E+01	2.1E+01	1.6E+01	1.6E+01
A2NNSNSL.rsa	1.4E+01	2.1E+01	1.6E+01	1.5E+01
A5ESINDL.rsa	1.0E+01	1.5E+01	9.3E+00	1.0E+01
AUG2D.mat	–	2.3E+03	2.5E+03	–
AUG2DC.mat	–	2.2E+03	2.3E+03	–
AUG3D.mat	3.1E+03	–	3.4E+03	3.1E+03
AUG3DCQP.mat	2.0E+01	2.1E+01	2.0E+01	2.0E+01
bcsstk35.RSA	5.3E+01	5.7E+01	5.3E+01	5.3E+01
bcsstk37.RSA	4.9E+01	5.4E+01	5.0E+01	4.9E+01
bcsstk39.RSA	1.0E+02	1.1E+02	1.1E+02	1.0E+02
BLOCKQP1.rsa	1.9E+01	3.7E+01	3.0E+01	3.0E+01
BLOWEYA.rsa	5.7E+00	8.7E+00	6.2E+00	5.9E+00
bmw3.2.rsa	7.9E+02	6.3E+02	8.0E+02	7.9E+02
BOYD1.RSA	2.6E+02	5.3E+01	5.1E+01	5.0E+01
BOYD2.RSA	1.5E+03	9.9E+01	6.0E+01	6.5E+01

Table 3.3.4.7: Actual memory used (Mbytes) (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BRAINPC2.rsa	6.3E+00	9.0E+00	7.0E+00	6.4E+00
BRATU3D.RSA	—	—	—	—
c-55.RSA	1.2E+02	6.0E+01	1.2E+02	1.7E+02
c-58.RSA	9.9E+01	5.9E+01	8.9E+01	1.2E+02
c-59.RSA	9.0E+01	7.2E+01	8.2E+01	1.2E+02
c-62.RSA	2.2E+02	1.1E+02	2.2E+02	3.5E+02
c-63.RSA	4.7E+01	4.0E+01	5.1E+01	5.9E+01
c-68.RSA	2.0E+02	9.9E+01	1.6E+02	2.3E+02
c-69.RSA	4.9E+01	5.0E+01	6.1E+01	6.0E+01
c-70.RSA	1.1E+02	7.4E+01	9.4E+01	1.4E+02
c-71.RSA	4.9E+02	2.1E+02	4.6E+02	8.6E+02
c-72.RSA	6.8E+01	5.6E+01	7.2E+01	9.2E+01
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	1.8E+02	1.2E+02	2.1E+02	1.8E+02
crystk02.RSA	9.7E+01	6.0E+01	8.0E+01	9.7E+01
crystk03.RSA	1.7E+02	1.3E+02	2.0E+02	1.7E+02
DARCY003.rsa	1.1E+02	1.3E+02	1.3E+02	1.2E+02
dawson5.rsa	7.0E+01	6.0E+01	7.3E+01	7.0E+01
DIXMAANL.rsa	1.3E+01	1.6E+01	1.3E+01	1.3E+01
DTOC.mat	—	4.1E+02	—	—
D_PRETOK.rsa	3.1E+02	1.8E+02	3.8E+02	3.1E+02
HELM2D03.rsa	3.5E+02	2.5E+02	3.7E+02	3.5E+02
HELM3D01.rsa	1.3E+02	7.1E+01	1.2E+02	1.3E+02
K1_SAN.rsa	5.6E+01	4.1E+01	8.1E+01	5.6E+01
LINVERSE.rsa	2.9E+00	4.5E+00	2.7E+00	3.0E+00
mario001.rsa	1.0E+01	1.2E+01	1.1E+01	1.0E+01
mario002.rsa	1.1E+02	1.3E+02	1.3E+02	1.2E+02
NCVXBQP1.rsa	7.8E+01	4.0E+01	8.8E+01	7.8E+01
NCVXQP1.mat	1.0E+02	3.4E+01	9.0E+01	1.0E+02
NCVXQP3.rsa	1.5E+03	3.1E+02	—	1.5E+03
NCVXQP5.rsa	8.4E+02	1.8E+02	6.9E+02	8.4E+02
NCVXQP7.rsa	—	4.8E+02	—	—
NCVXQP9.mat	5.7E+00	4.9E+00	5.7E+00	5.7E+00
olesnik0.rsa	8.1E+01	5.6E+01	1.0E+02	8.1E+01
qa8fk.RSA	5.3E+02	2.6E+02	5.9E+02	5.3E+02
SIT100.rsa	1.4E+01	5.8E+00	1.1E+01	1.4E+01
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	6.4E+00	9.8E+00	6.2E+00	6.5E+00
stokes128.mat	3.5E+01	3.8E+01	4.3E+01	3.5E+01
stokes64.mat	8.1E+00	9.0E+00	9.6E+00	8.1E+00
stokes64s.mat	8.1E+00	9.0E+00	9.6E+00	8.1E+00
tuma1.mat	9.1E+00	8.5E+00	1.2E+01	9.2E+00
tuma2.mat	4.3E+00	4.6E+00	5.8E+00	4.4E+00
TURON_M.rsa	2.8E+02	1.6E+02	3.5E+02	2.8E+02
vibrobox.RSA	3.6E+01	3.6E+01	4.6E+01	3.6E+01

Table 3.3.4.8: Number of integers used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	499964	488063	500041	510028
A2NNSNSL.rsa	476517	483054	476593	496371
A5ESINDL.rsa	335003	315020	335009	345008
AUG2D.mat	–	1696654	350480	–
AUG2DC.mat	–	1864732	383853	–
AUG3D.mat	319170	–	2684432	319170
AUG3DCQP.mat	237520	913014	499231	237520
bcsstk35.RSA	227235	257689	230725	227235
bcsstk37.RSA	204333	239321	207393	204333
bcsstk39.RSA	395732	444080	410448	395732
BLOCKQP1.rsa	399890	320025	400023	400020
BLOWEYA.rsa	140001	146564	130006	140002
bmw3.2.rsa	2080352	2380330	2191984	2080352
BOYD1.RSA	435270	838862	838835	838792
BOYD2.RSA	2140797	2195779	2195775	2195771
BRAINPC2.rsa	151810	136452	213875	151810
BRATU3D.RSA	–	–	–	–
c-55.RSA	432974	2260962	3289719	648097
c-58.RSA	571050	1915631	1548690	872739
c-59.RSA	500207	2230221	2033716	1758490
c-62.RSA	605110	4410054	7011673	855054
c-63.RSA	428798	1435576	1439617	755742
c-68.RSA	754158	3602630	3983611	1991247
c-69.RSA	600132	1786367	1764882	683146
c-70.RSA	647169	2387569	2562800	767608
c-71.RSA	1033717	7837391	11862274	1260328
c-72.RSA	738899	1960644	1989185	933284
CONT-201.RSA	–	–	–	–
CONT-300.RSA	–	–	–	–
copter2.rsa	841598	984319	883359	841598
crystk02.RSA	173257	183323	182530	173257
crystk03.RSA	317983	348973	330965	317983
DARCY003.rsa	1937373	2005536	1962272	1937373
dawson5.rsa	564145	617506	582124	564145
DIXMAANL.rsa	459959	481335	389981	459959
DTOC.mat	–	174337	–	–
D_PRETOK.rsa	1305410	1313697	1347221	1305410
HELM2D03.rsa	3744078	3897412	3825244	3744078
HELM3D01.rsa	482270	612625	559374	482270
K1_SAN.rsa	442337	447584	469478	442337
LINVERSE.rsa	41989	59811	41995	41989
mario001.rsa	186966	193916	189652	186966
mario002.rsa	1937373	2005536	1962272	1937373
NCVXBQP1.rsa	517265	518335	534043	517265
NCVXQP1.mat	198136	475207	668269	198136
NCVXQP3.rsa	2084284	4363326	–	2084284
NCVXQP5.rsa	1230776	2143379	2908481	1230776
NCVXQP7.rsa	–	7518499	–	–

Table 3.3.4.8: Number of integers used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	91814	108076	106108	91814
olesnik0.rsa	581713	588354	614863	581713
qa8fk.RSA	1861292	1119350	1556234	1861292
SIT100.rsa	86603	71661	84732	86603
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	129970	150801	129975	129970
stokes128.mat	306893	398853	317926	306893
stokes64.mat	76565	99199	78726	76565
stokes64s.mat	76565	99199	78726	76565
tuma1.mat	122997	127076	127748	122997
tuma2.mat	67108	70505	70326	67108
TURON_M.rsa	1339403	1341309	1393907	1339403
vibrobox.RSA	217871	291051	222172	217871

Table 3.3.4.9: Number of reals used for factors

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	340046	349813	340031	350035
A2NNSNSL.rsa	324407	329192	324392	336378
A5ESINDL.rsa	215002	230003	215002	225001
AUG2D.mat	—	6114686	6521828	—
AUG2DC.mat	—	6191556	7704686	—
AUG3D.mat	20253212	—	18661584	20253212
AUG3DCQP.mat	958084	1009873	1003491	958084
bcsstk35.RSA	2730502	3071020	2878066	2730502
bcsstk37.RSA	2824145	3248113	3004411	2824145
bcsstk39.RSA	6688229	7536059	7852736	6688229
BLOCKQP1.rsa	380113	780068	380068	380068
BLOWEYA.rsa	140008	160945	130009	140009
bmw3_2.rsa	52963395	45755177	59779030	52963395
BOYD1.RSA	26694808	652378	652378	652378
BOYD2.RSA	61603776	1263167	1263167	1263171
BRAINPC2.rsa	158695	307558	158697	158699
BRATU3D.RSA	—	—	—	—
c-55.RSA	4712382	3294587	5168011	6779201
c-58.RSA	2270842	2574907	2365903	2385969
c-59.RSA	3285590	3324402	3279860	4590716
c-62.RSA	10464882	6508368	10933899	14252644
c-63.RSA	2290982	2134757	2376334	2732959
c-68.RSA	6504445	5080374	6178885	7426171
c-69.RSA	2434497	2498774	2696315	3087274
c-70.RSA	4393890	3461067	4234877	5887278
c-71.RSA	20184253	12026647	20207062	28916175
c-72.RSA	3161838	2755401	3306942	3915951
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	14132982	9693996	17227168	14132982
crystk02.RSA	6098260	4185822	5852382	6098260

Table 3.3.4.9: Number of reals used for factors (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk03.RSA	11904216	9480888	14710431	11904216
DARCY003.rsa	6941313	6384124	7628724	6941313
dawson5.rsa	4624921	3999726	5211272	4624921
DIXMAANL.rsa	339981	383144	349980	339981
DTOC.mat	–	289617	–	–
D_PRETOK.rsa	24528780	13613775	33445303	24528780
HELM2D03.rsa	28015793	18900733	31686809	28015793
HELM3D01.rsa	7629570	5082794	8145267	7629570
K1_SAN.rsa	4282567	2918071	6567122	4282567
LINVERSE.rsa	53988	92381	53988	53988
mario001.rsa	529699	523591	582220	529699
mario002.rsa	6941313	6384124	7628724	6941313
NCVXBQP1.rsa	4141288	2035410	5375688	4141288
NCVXQP1.mat	4487213	2107144	4534616	4487213
NCVXQP3.rsa	78878572	23176209	–	78878572
NCVXQP5.rsa	38990831	12336577	37572285	38990831
NCVXQP7.rsa	–	36415858	–	–
NCVXQP9.mat	262694	206760	273178	262694
olesnik0.rsa	6061585	4094599	8421776	6061585
qa8fk.RSA	40901710	21607991	51388343	40901710
SIT100.rsa	906235	398283	790505	906235
SPARSINE.rsa	–	–	–	–
SPMSRTLs.rsa	129971	229096	129971	129971
stokes128.mat	2714396	2908653	3362745	2714396
stokes64.mat	557892	608953	664992	557892
stokes64s.mat	557892	608977	664992	557892
tuma1.mat	536123	444226	693366	536123
tuma2.mat	224253	210353	301202	224253
TURON_M.rsa	23258474	12984582	31248581	23258474
vibrobox.RSA	2086588	2260948	2672558	2086588

Table 3.3.4.10: Total number of integers used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	505049	533068	545045	555057
A2NNSNSL.rsa	482995	526101	519644	539446
A5ESINDL.rsa	340016	340033	360017	370021
AUG2D.mat	–	1677076	331018	–
AUG2DC.mat	–	1844348	363477	–
AUG3D.mat	296000	–	2659181	296000
AUG3DCQP.mat	239580	913047	499300	239580
bcsstk35.RSA	770442	770442	770442	770442
bcsstk37.RSA	608748	608748	608748	608748
bcsstk39.RSA	1114810	1114810	1114810	1114810
BLOCKQP1.rsa	420062	560062	640053	640053
BLOWEYA.rsa	150024	146640	150024	150024
bmw3.2.rsa	5985363	5985363	5985363	5985363

Table 3.3.4.10: Total number of integers used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD1.RSA	838820	1238275	1332492	1312115
BOYD2.RSA	2288358	2382983	2411473	2426941
BRAINPC2.rsa	207060	138212	213955	207069
BRATU3D.RSA	—	—	—	—
c-55.RSA	448582	2260977	3289754	673511
c-58.RSA	587826	1915646	1548712	892526
c-59.RSA	510453	2230259	2033788	1782175
c-62.RSA	632337	4410059	7011691	898651
c-63.RSA	433938	1435597	1439710	765430
c-68.RSA	769246	3602646	3983645	2038677
c-69.RSA	604002	1786446	1764950	695602
c-70.RSA	657874	2387585	2562896	783354
c-71.RSA	1062901	7837410	11862366	1312747
c-72.RSA	744548	1960734	1989303	945117
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	866219	987793	894550	866219
crystk02.RSA	505244	505244	505244	505244
crystk03.RSA	912638	912638	912638	912638
DARC003.rsa	1939303	2006678	1964020	1939303
dawson5.rsa	582864	622109	588856	582864
DIXMAANL.rsa	459984	481386	390001	459984
DTOC.mat	—	169346	—	—
D-PRETOK.rsa	1314332	1315949	1354732	1314332
HELM2D03.rsa	3752224	3901018	3831360	3752224
HELM3D01.rsa	496295	617525	564262	496295
K1_SAN.rsa	445053	448757	472979	445053
LINVERSE.rsa	71992	72008	71992	71992
mario001.rsa	187570	194278	190256	187570
mario002.rsa	1939303	2006678	1964020	1939303
NCVXBQP1.rsa	519658	521468	541085	519658
NCVXQP1.mat	208331	475930	669344	208331
NCVXQP3.rsa	2119970	4365027	—	2119970
NCVXQP5.rsa	1258063	2144230	2909748	1258063
NCVXQP7.rsa	—	7518868	—	—
NCVXQP9.mat	92584	108157	106351	92584
olesnik0.rsa	585541	589626	618144	585541
qa8fk.RSA	1892539	1133613	1577613	1892539
SIT100.rsa	89006	72139	85980	89006
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	159976	159976	159977	159976
stokes128.mat	362008	400431	362008	362008
stokes64.mat	90904	99981	90904	90904
stokes64s.mat	90904	99981	90904	90904
tuma1.mat	124164	127725	128821	124164
tuma2.mat	67737	70876	71069	67737
TURON_M.rsa	1348714	1343739	1400012	1348714
vibrobox.RSA	230085	299522	232008	230085

Table 3.3.4.11: Total number of reals used

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	450038	529825	520043	530079
A2NNSNSL.rsa	409414	493773	488973	500991
A5ESINDL.rsa	249997	280030	265012	275016
AUG2D.mat	—	201005184	203913793	—
AUG2DC.mat	—	216156560	221446339	—
AUG3D.mat	328977068	—	355690986	328977068
AUG3DCQP.mat	1726157	1430626	1576630	1726157
bcsstk35.RSA	2987166	3225871	3107242	2987166
bcsstk37.RSA	3264551	3577173	3457718	3264551
bcsstk39.RSA	7106639	8066011	8412126	7106639
BLOCKQP1.rsa	420242	2100227	1700210	1700221
BLOWEYA.rsa	140055	151216	140044	140056
bmw3.2.rsa	66435907	50550296	71920035	66435907
BOYD1.RSA	28289564	1805153	2101859	2030546
BOYD2.RSA	182449799	1450379	1507382	1516334
BRAINPC2.rsa	193323	308047	193318	193318
BRATU3D.RSA	—	—	—	—
c-55.RSA	13203567	4564293	11659991	17693133
c-58.RSA	9943532	4656835	8054562	11520015
c-59.RSA	9261228	6239169	7714183	11103050
c-62.RSA	22871375	8836919	21359539	39138596
c-63.RSA	4258834	2954024	4371329	5244986
c-68.RSA	23456529	7780354	15697063	23728178
c-69.RSA	3726913	3360969	4622294	4923730
c-70.RSA	10583360	5663561	8500970	14576416
c-71.RSA	54825009	18316485	45922289	100025236
c-72.RSA	5866470	3481076	5725761	8792856
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	18391275	11496347	23552661	18391275
crystk02.RSA	8827118	4946689	7553397	8827118
crystk03.RSA	15713960	11223705	19640568	15713960
DARCY003.rsa	7562066	6614318	8277800	7562066
dawson5.rsa	5752363	4408102	6159143	5752363
DIXMAANL.rsa	380038	383271	350058	380038
DTOC.mat	—	44017125	—	—
D_PRETOK.rsa	31152370	15045629	41546742	31152370
HELM2D03.rsa	32569973	20003852	35809219	32569973
HELM3D01.rsa	13761359	6809319	13103162	13761359
K1_SAN.rsa	4996624	3148728	7959541	4996624
LINVERSE.rsa	60021	92742	60021	60021
mario001.rsa	575236	548562	658749	575236
mario002.rsa	7562066	6614318	8277800	7562066
NCVXBQP1.rsa	8068030	2623074	9192875	8068030
NCVXQP1.mat	11398570	3468151	10481032	11398570
NCVXQP3.rsa	176798624	33110120	—	176798624
NCVXQP5.rsa	88843236	16797552	65985531	88843236
NCVXQP7.rsa	—	52439829	—	—

Table 3.3.4.11: Total number of reals used (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
NCVXQP9.mat	423137	226252	392381	423137
olesnik0.rsa	7451672	4411526	9988846	7451672
qa8fk.RSA	55505819	25207355	64290070	55505819
SIT100.rsa	1366649	445855	1047699	1366649
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	130005	229228	130011	130005
stokes128.mat	2946251	3095685	3809791	2946251
stokes64.mat	622493	655527	766876	622493
stokes64s.mat	622493	655527	766876	622493
tuma1.mat	687742	524576	939946	687742
tuma2.mat	277035	242206	413967	277035
TURON_M.rsa	28481724	14192208	36634469	28481724
vibrobox.RSA	3408950	3313508	4731983	3408950

Table 3.3.4.12: Norm of scaled residuals

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	1.3E-15	1.0E-15	1.1E-15	1.2E-15
A2NNSNSL.rsa	6.6E-16	1.5E-15	9.4E-16	2.0E-15
A5ESINDL.rsa	1.2E-14	9.0E-15	3.1E-14	8.2E-16
AUG2D.mat	—	0.0E+00	0.0E+00	—
AUG2DC.mat	—	0.0E+00	0.0E+00	—
AUG3D.mat	0.0E+00	—	0.0E+00	0.0E+00
AUG3DCQP.mat	1.3E-16	1.3E-16	1.3E-16	1.3E-16
bcsstk35.RSA	2.0E-16	2.9E-16	4.2E-16	2.0E-16
bcsstk37.RSA	1.1E-15	1.2E-15	1.2E-15	1.1E-15
bcsstk39.RSA	2.6E-16	2.6E-16	2.7E-16	2.6E-16
BLOCKQP1.rsa	1.2E-12	1.2E-12	1.2E-12	1.2E-12
BLOWEYA.rsa	1.4E-13	8.2E-14	1.4E-13	1.2E-13
bmw3_2.rsa	3.9E-16	2.5E-16	2.6E-16	3.9E-16
BOYD1.RSA	2.5E-09	3.5E-09	4.1E-09	4.6E-09
BOYD2.RSA	4.6E-07	6.7E-07	6.7E-07	6.8E-07
BRAINPC2.rsa	8.0E-12	9.0E-11	7.4E-12	8.0E-12
BRATU3D.RSA	—	—	—	—
c-55.RSA	3.7E-11	1.6E-10	7.7E-11	5.1E-11
c-58.RSA	2.2E-10	6.2E-10	3.2E-10	2.3E-10
c-59.RSA	8.3E-10	1.1E-09	1.3E-09	3.5E-09
c-62.RSA	7.0E-10	6.6E-10	9.2E-10	5.0E-10
c-63.RSA	2.2E-10	3.6E-10	2.8E-10	4.5E-10
c-68.RSA	5.2E-14	2.4E-13	4.0E-13	1.0E-13
c-69.RSA	4.9E-11	9.7E-11	6.0E-11	3.6E-11
c-70.RSA	5.2E-11	5.7E-11	3.5E-11	7.6E-11
c-71.RSA	5.6E-10	9.6E-10	1.1E-09	4.7E-10
c-72.RSA	3.9E-11	2.3E-10	3.1E-11	7.2E-11
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	5.5E-11	3.6E-11	6.9E-11	5.5E-11
crystk02.RSA	2.1E-15	2.1E-15	2.1E-15	2.1E-15

Table 3.3.4.12: Norm of scaled residuals (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
crystk03.RSA	2.7E-15	2.8E-15	2.8E-15	2.7E-15
DARCY003.rsa	1.9E-15	1.6E-15	2.0E-15	1.9E-15
dawson5.rsa	1.3E-11	1.1E-11	1.5E-12	1.3E-11
DIXMAANL.rsa	2.9E-14	3.4E-15	6.2E-15	2.9E-14
DTOC.mat	–	9.4E-10	–	–
D_PRETOK.rsa	2.5E-15	1.3E-15	6.4E-15	2.5E-15
HELM2D03.rsa	3.7E-12	3.7E-12	1.8E-11	3.7E-12
HELM3D01.rsa	2.8E-12	2.5E-12	1.4E-11	2.8E-12
K1_SAN.rsa	4.0E-15	2.3E-15	2.2E-14	4.0E-15
LINVERSE.rsa	9.5E-16	7.2E-16	1.8E-16	9.5E-16
mario001.rsa	1.1E-15	1.3E-15	1.8E-15	1.1E-15
mario002.rsa	1.9E-15	1.6E-15	2.0E-15	1.9E-15
NCVXBQP1.rsa	1.1E-13	8.9E-14	7.2E-13	1.1E-13
NCVXQP1.mat	1.1E-14	2.4E-14	2.2E-14	1.1E-14
NCVXQP3.rsa	4.8E-08	4.7E-07	–	4.8E-08
NCVXQP5.rsa	1.2E-09	5.1E-10	4.3E-09	1.2E-09
NCVXQP7.rsa	–	3.2E-07	–	–
NCVXQP9.mat	1.9E-16	3.1E-16	2.2E-16	1.9E-16
olesnik0.rsa	5.5E-15	1.4E-15	7.1E-15	5.5E-15
qa8fk.RSA	2.6E-14	2.0E-14	2.5E-14	2.6E-14
SIT100.rsa	4.8E-15	2.0E-15	2.1E-15	4.8E-15
SPARSINE.rsa	–	–	–	–
SPMSRTLS.rsa	8.4E-14	2.5E-14	3.1E-14	8.4E-14
stokes128.mat	1.0E-12	2.7E-13	3.9E-12	1.0E-12
stokes64.mat	1.3E-13	8.5E-14	8.1E-13	1.3E-13
stokes64s.mat	7.3E-15	1.3E-14	7.4E-14	7.3E-15
tuma1.mat	1.6E-14	2.1E-14	3.6E-14	1.6E-14
tuma2.mat	1.2E-14	1.8E-14	3.2E-14	1.2E-14
TURON_M.rsa	4.4E-15	4.0E-15	9.4E-15	4.4E-15
vibrobox.RSA	2.9E-16	2.8E-16	3.1E-16	2.9E-16

Table 3.3.4.13: Norm of scaled residuals following a single refinement

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
A0NSDSIL.rsa	5.9E-17	8.3E-17	1.1E-16	1.1E-16
A2NNSNSL.rsa	5.6E-17	5.2E-17	1.1E-16	1.5E-16
A5ESINDL.rsa	1.2E-16	1.4E-16	3.8E-17	1.2E-16
AUG2D.mat	–	0.0E+00	0.0E+00	–
AUG2DC.mat	–	0.0E+00	0.0E+00	–
AUG3D.mat	0.0E+00	–	0.0E+00	0.0E+00
AUG3DCQP.mat	5.4E-17	5.3E-17	4.9E-17	5.4E-17
bcsstk35.RSA	1.1E-16	2.6E-16	1.5E-16	1.1E-16
bcsstk37.RSA	9.5E-16	9.3E-16	9.7E-16	9.5E-16
bcsstk39.RSA	2.1E-16	2.2E-16	2.2E-16	2.1E-16
BLOCKQP1.rsa	4.9E-14	2.4E-15	2.4E-15	2.4E-15
BLOWEYA.rsa	1.8E-13	1.8E-13	1.8E-13	6.0E-14
bmw3_2.rsa	2.3E-16	2.1E-16	2.8E-16	2.3E-16

Table 3.3.4.13: Norm of scaled residuals following a single refinement (continued)

Name	MA57	MA57_METIS	MA57_MA27	MA57_MC50
BOYD1.RSA	4.9E-16	2.7E-15	3.2E-15	6.8E-15
BOYD2.RSA	2.1E-15	1.6E-15	2.5E-15	3.6E-15
BRAINPC2.rsa	6.6E-15	6.5E-15	6.3E-15	6.3E-15
BRATU3D.RSA	—	—	—	—
c-55.RSA	6.5E-16	6.5E-16	6.7E-16	6.6E-16
c-58.RSA	3.2E-15	2.3E-15	3.4E-15	2.7E-15
c-59.RSA	9.1E-15	7.9E-15	9.3E-15	9.6E-15
c-62.RSA	1.6E-15	2.8E-15	2.6E-15	2.0E-15
c-63.RSA	1.3E-16	1.1E-15	6.4E-16	6.8E-16
c-68.RSA	5.9E-17	5.9E-17	1.2E-17	5.9E-17
c-69.RSA	7.0E-17	3.5E-17	8.9E-17	6.3E-17
c-70.RSA	2.9E-16	2.9E-16	2.9E-16	2.9E-16
c-71.RSA	1.9E-15	1.6E-15	1.8E-15	8.6E-16
c-72.RSA	1.4E-15	1.2E-15	1.5E-15	1.4E-15
CONT-201.RSA	—	—	—	—
CONT-300.RSA	—	—	—	—
copter2.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
crystk02.RSA	1.4E-15	1.4E-15	1.5E-15	1.4E-15
crystk03.RSA	1.8E-15	1.8E-15	1.8E-15	1.8E-15
DARCY003.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
dawson5.rsa	2.3E-16	2.3E-16	2.3E-16	2.3E-16
DIXMAANL.rsa	1.0E-16	9.9E-17	9.9E-17	1.0E-16
DTOC.mat	—	1.0E-12	—	—
D_PRETOK.rsa	9.8E-17	1.0E-16	1.1E-16	9.8E-17
HELM2D03.rsa	3.9E-15	3.9E-15	3.9E-15	3.9E-15
HELM3D01.rsa	1.9E-16	1.9E-16	1.9E-16	1.9E-16
K1_SAN.rsa	1.1E-16	1.1E-16	1.2E-16	1.1E-16
LINVERSE.rsa	9.4E-17	9.5E-17	9.5E-17	9.4E-17
mario001.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
mario002.rsa	1.2E-16	1.2E-16	1.2E-16	1.2E-16
NCVXBQP1.rsa	1.3E-16	1.3E-16	1.3E-16	1.3E-16
NCVXQP1.mat	1.3E-16	1.4E-16	1.3E-16	1.3E-16
NCVXQP3.rsa	1.1E-14	6.2E-13	—	1.1E-14
NCVXQP5.rsa	3.4E-16	1.5E-16	2.3E-15	3.4E-16
NCVXQP7.rsa	—	1.0E-15	—	—
NCVXQP9.mat	1.3E-23	1.3E-23	1.1E-23	1.3E-23
olesnik0.rsa	8.7E-17	9.0E-17	9.0E-17	8.7E-17
qa8fk.RSA	1.0E-14	1.0E-14	7.7E-15	1.0E-14
SIT100.rsa	5.0E-16	7.7E-16	4.3E-16	5.0E-16
SPARSINE.rsa	—	—	—	—
SPMSRTLS.rsa	1.3E-16	1.4E-16	1.3E-16	1.3E-16
stokes128.mat	2.5E-12	6.9E-14	1.3E-11	2.5E-12
stokes64.mat	6.5E-13	2.4E-13	5.9E-12	6.5E-13
stokes64s.mat	5.9E-15	1.5E-14	1.1E-13	5.9E-15
tuma1.mat	9.5E-17	9.5E-17	9.6E-17	9.5E-17
tuma2.mat	9.6E-17	9.3E-17	9.6E-17	9.6E-17
TURON_M.rsa	1.8E-16	1.6E-16	1.8E-16	1.8E-16
vibrobox.RSA	1.2E-16	1.2E-16	1.3E-16	1.2E-16

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References

- P. R. Amestoy, T. A. Davis, and I. S. Duff. An approximate minimum degree ordering algorithm. *SIAM Journal on Matrix Analysis and Applications*, **17**(1), 15–41, 1996.
- I. Bongartz, A. R. Conn, N. I. M. Gould, and Ph. L. Toint. CUTE: Constrained and unconstrained testing environment. *ACM Transactions on Mathematical Software*, **21**(1), 123–160, 1995.
- I. S. Duff. MA57 - a new code for the solution of sparse symmetric definite and indefinite systems. Technical Report RAL-TR-2002-024, Rutherford Appleton Laboratory, Chilton, Oxfordshire, England, 2002.
- I. S. Duff, A. M. Erisman, and J. K. Reid. *Direct Methods for Sparse Matrices*. Oxford University Press, Oxford, England, 1986.
- I. S. Duff, Roger G. Grimes, and John G. Lewis. Sparse matrix test problems. *ACM Transactions on Mathematical Software*, **15**(1), 1–14, 1989.
- I. S. Duff, R. G. Grimes, and J. G. Lewis. The Rutherford-Boeing sparse matrix collection. Technical Report RAL-TR-97-031, Rutherford Appleton Laboratory, Chilton, Oxfordshire, England, 1997.
- N. I. M. Gould and J. A. Scott. A numerical evaluation of HSL packages for the direct-solution of large sparse, symmetric linear systems of equation. Technical Report RAL-TR-2003-Oxx, Rutherford Appleton Laboratory, Chilton, Oxfordshire, England, 2003.
- N. I. M. Gould, D. Orban, and Ph. L. Toint. CUTEr (and SifDec), a constrained and unconstrained testing environment, revisited. Technical Report RAL-TR-2002-009, Rutherford Appleton Laboratory, Chilton, Oxfordshire, England, 2002.
- A. Gupta. Recent advances in direct methods or solving unsymmetric sparse systems of linear equations. *ACM Transactions on Mathematical Software*, **28**(3), 301–324, 2002.
- HSL. A collection of Fortran codes for large-scale scientific computation, 2002. See <http://www.cse.clrc.ac.uk/Activity/HSL>.
- G. Karypis and V. Kumar. A fast and high quality multilevel scheme for partitioning irregular graphs. *SIAM Journal on Scientific Computing*, **20**(2), 359–392, 1999.
- G. Kumfert and A. Pothen. Two improved algorithms for envelope and wavefront reduction. *BIT*, **37**(3), 559–590, 1997.
- I. Maros and C. Mészáros. A repository of convex quadratic programming problems. *Optimization Methods and Software*, **11-12**, 671–681, 1999.