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On-line appendices to the paper "Trajectory-following methods for large-scale degenerate convex quadratic programming"

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Appendix A

In Table A.1, we list the problems used in our tests. These include almost all of the examples in the CUTEr [1] and Maros and Meszaros [2] test sets—multiple instances of very similar nature have been excluded. For each example, the table gives the number of variables n and the number of general constraints m, and indicates whether there are redundant equality constraints (R), degenerate general inequality constraints (C) and degenerate simple bounds on the variables (B).

Table A.1: Problem statistics

name	n	m	R	C	B	name	n	m	R	C	B
A0ENDNDL	45006	15002	√		√	DUAL1	85	1			
A0ENINDL	45006	15002	√		√	DUAL2	96	1			
A0ENSNDL	45006	15002	√		√	DUAL3	111	1			
A0ESDNDL	45006	15002	√		√	DUAL4	75	1			
A0ESINDL	45006	15002	√		√	DUALC1	9	215			
A2ENDNDL	45006	15002	√		√	DUALC2	7	229			
A2ENINDL	45006	15002	√		√	DUALC5	8	278			
A2ENSNDL	45006	15002	√		√	DUALC8	8	503			
A2ESDNDL	45006	15002	√		√	EXDATA	3000	3001			
A2ESINDL	45006	15002	√		√	GENHS28	10	8			
A5ENINDL	45006	15002	√		√	GOULDQP2	19999	9999	√		
A5ENSNDL	45006	15002	√		√	GOULDQP3	19999	9999	√		
A5ESDNDL	45006	15002	√		√	HS21	2	1			
A5ESINDL	45006	15002	√		√	HS35	3	1			
A5ESSNDL	45006	15002	√		√	HS35MOD	3	1			
AUG2D	20200	10000	√			HS51	5	3	√		
AUG2DC	20200	10000				HS52	5	3			
AUG2DCQP	20200	10000				HS53	5	3			
AUG2DQP	20200	10000	√			HS76	4	3			
AUG3D	27543	8000	√			HS118	15	17			
AUG3DC	27543	8000				HS268	5	5			
AUG3DCQP	27543	8000				HUES-MOD	5000	2			
AUG3DQP	27543	8000	√			HUESTIS	100	2			
BOYD1	93261	18				KSIP	20	1001			
BOYD2	93263	186531	√			LASER	1002	1000			
CONT5-QP	40601	40200	√		√	LEUVEN1	1530	2220	√		
CONT-050	2597	2401	√			LEUVEN2	1530	2329	√		

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Table A.1: Problem statistics (continued)

name	n	m	R	C	B	name	n	m	R	C	B
CONT-100	10197	9801	√			LEUVEN7	360	946			
CONT-101	10197	10098				LISWET1	2002	2000			
CONT-200	40397	39601	√			LISWET2	2002	2000			
CONT-201	40397	40198				LISWET3	2002	2000		√	
CONT-300	90597	90298				LISWET4	2002	2000		√	
CVXQP1_L	10000	5000				LISWET5	2002	2000		√	
CVXQP1_M	1000	500				LISWET6	2002	2000		√	
CVXQP1_S	100	50				LISWET7	2002	2000			
CVXQP2_L	10000	2500				LISWET8	2002	2000		√	
CVXQP2_M	1000	250				LISWET9	2002	2000			
CVXQP2_S	100	25				LISWET10	2002	2000		√	
CVXQP3_L	10000	7500				LISWET12	2002	2000			
CVXQP3_M	1000	750				LOTSCHD	12	7			
CVXQP3_S	100	75				MOSARQP1	2500	700			
DEGDIAG	100001	0			√	MOSARQP2	2500	700			
DEGENQP	50	125025	√			MPC1	2550	3833	√		
DEGTRID	100001	0			√	MPC2	1530	2351	√		
DEGTRID2	100001	0			√	MPC3	1530	2351	√		
DEGTRIDL	100001	1			√	MPC4	1530	2351	√		
DPKLO1	133	77				MPC5	1530	2351	√		
DTOC3	4499	2998				MPC6	1530	2351	√		√
MPC7	1530	2351	√		√	QPILOTNO	2172	975	√	√	√
MPC8	1530	2351	√		√	QPTEST	2	2			
MPC9	1530	2351	√		√	QRECIPE	180	91	√		
MPC10	1530	2351	√		√	QSC205	203	205	√	√	
MPC11	1530	2351	√	√		QSCAGR25	500	471			
MPC12	1530	2351	√			QSCAGR7	140	129			
MPC13	1530	2351	√		√	QSCFXM1	457	330			
MPC14	1530	2351	√			QSCFXM2	914	660			
MPC15	1530	2351	√		√	QSCFXM3	1371	990			
MPC16	1530	2351	√			QSCORPIO	358	388	√		
POWELL20	10000	10000				QSCRS8	1169	490	√		
PRIMAL1	325	85				QSCSD1	760	77			
PRIMAL2	649	96				QSCSD6	1350	147	√		
PRIMAL3	745	111				QSCSD8	2750	397			√
PRIMAL4	1489	75				QSCTAP1	480	300	√		
PRIMALC1	230	9				QSCTAP2	1880	1090	√		
PRIMALC2	231	7				QSCTAP3	2480	1480	√		
PRIMALC5	287	8				QSEBA	1028	515	√		
PRIMALC8	520	8				QSHARE1B	225	117			
Q25FV47	1571	820			√	QSHARE2B	79	96			
QADLITTL	97	56				QSHELL	1775	536	√		
QAFIRO	32	27	√			QSHIP04L	2118	402	√		
QPBAND	5	2	√			QSHIP04S	1458	402	√		
QBANDM	472	305				QSHIP08L	4283	778	√		
QBEACONF	262	173				QSHIP08S	2387	778	√		
QBORE3D	315	233	√			QSHIP12L	5427	1151	√		
QBRANDY	249	220	√	√		QSHIP12S	2763	1151	√		
QCAPRI	353	271			√	QSIERRA	2036	1227	√		
QE226	282	223	√			QSTAIR	467	356	√		√
QETAMACR	688	400	√			QSTANDAT	1075	359		√	
QFFFFF80	854	524				S268	5	5			
QFORPLAN	421	161		√		STADAT1	2001	3999			
QGFRDXPN	1092	616				STADAT2	2001	3999		√	
QGROW7	301	140				STADAT3	4001	7999			
QGROW15	645	300				STCQP1	8193	4095	√		
QGROW22	946	440			√	STCQP2	8193	4095	√		
QISRAEL	142	174				TAME	2	1	√		
QPCBLEND	83	74			√	UBH1	9009	6000	√		√
QPCBOEI1	384	351		√		VALUES	202	1	√		√
QPCBOEI2	143	166		√		YAO	2002	2000			
QPCSTAIR	467	356				ZECEVIC2	2	2			

In Tables A.2–A.5, we report the results of running `CQP` with the four arc approximations T1, T2, P2 and P4. Here we list the value of the objective function reached on termination (f), the norms of the violations of the primal ($\|r^{\mathrm{P}}\|$) and dual ($\|r^{\mathrm{D}}\|$) feasibility measures and complementary slackness ($\|r^{\mathrm{CS}}\|$), the number of iterations/factorizations performed (`iter`), the total time taken in seconds (`time`) and the exit status (`status`). The exit status is zero if the required convergence tolerances have been reached, while nonzero values indicate that ill-conditioning has prevented satisfactory convergence. Specifically,

-16 is returned by the linear equation solver SLS to record that iterative refinement is diverging because (the package believes) the relevant matrix is too ill conditioned, while -17 indicates that the computed correction is too small to improve the current estimate of the solution. Both are symptomatic of (but do not guarantee) that we are close to the solution, and indeed the primal and dual feasibility in the detailed tables indicate that this is so.

Note that the value of the objective reported is that obtained by the package at a point that satisfies the given primal and dual infeasibility and violation of complementary slackness, not the actual optimal value; to find the latter, the convergence tolerances would need to be effectively zero.

Table A.2: Complete results for option T1

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
A0ENDNDL	7.73149327E-03	1.9E-12	1.0E-04	1.2E-05	17	0.83	0
A0ENINDL	7.73149454E-03	6.1E-13	1.0E-04	1.2E-05	17	0.83	0
A0ENSNDL	3.10489826E+04	9.0E-07	1.2E-04	9.1E+00	62	2.55	-17
A0ESDNDL	7.73149129E-03	3.2E-13	1.0E-04	1.2E-05	17	0.83	0
A0ESINDL	7.73150040E-03	6.5E-13	1.0E-04	1.2E-05	17	0.83	0
A2ENDNDL	3.05029514E-02	2.8E-14	1.0E-04	3.0E-05	21	1.00	0
A2ENINDL	2.99220116E-02	1.3E-13	1.0E-04	3.0E-05	21	1.03	0
A2ENSNDL	8.90502503E+01	1.8E-09	1.0E-04	7.8E-02	84	38.55	-17
A2ESDNDL	3.05029628E-02	4.3E-13	1.0E-04	3.0E-05	21	1.00	0
A2ESINDL	2.99219996E-02	2.8E-14	1.0E-04	3.0E-05	21	1.00	0
A5ENINDL	2.04652048E-02	1.6E-13	1.0E-04	8.0E-06	22	1.04	0
A5ENSNDL	5.05767118E+03	5.1E-09	1.1E-04	1.6E+00	69	21.72	-17
A5ESDNDL	1.98718208E-02	3.6E-13	1.0E-04	8.0E-06	22	1.05	0
A5ESINDL	2.04652065E-02	5.2E-13	1.0E-04	8.0E-06	22	1.04	0
A5ESSNDL	4.72908332E+03	2.1E-09	1.1E-04	1.6E+00	69	23.36	-17
AUG2D	1.68741175E+06	1.1E-14	3.5E-04	1.9E-12	1	0.07	0
AUG2DC	1.81836807E+06	1.1E-14	3.5E-04	1.9E-12	1	0.07	0
AUG2DCQP	6.49813475E+06	2.6E-14	6.5E-04	3.1E-03	58	2.88	0
AUG2DQP	6.23701208E+06	2.8E-14	6.6E-04	6.6E-04	60	2.97	0
AUG3D	2.45614860E+04	2.6E-15	5.8E-05	1.4E-14	1	0.19	0
AUG3DC	2.76540711E+04	2.7E-15	5.6E-05	2.2E-14	1	0.19	0
AUG3DCQP	6.15603863E+04	1.7E-06	8.3E-05	5.4E-05	51	8.09	0
AUG3DQP	5.42290680E+04	3.6E-15	8.5E-05	2.5E-04	51	8.08	0
BOYD1	-6.17352196E+07	4.0E-02	3.4E-04	7.7E-05	112	22.57	0
BOYD2	2.12596877E+01	9.8E-02	5.9E-05	1.5E-05	91	79.43	0
CONT5-QP	1.44801729E-02	1.0E-11	9.6E-06	9.1E-06	19	9.58	0
CONT-050	-4.56349701E+00	3.1E-15	3.5E-05	1.5E-06	10	0.17	0
CONT1-10	-4.62392228E+00	2.9E-15	3.4E-05	4.2E-06	10	0.92	0
CONT-101	2.02045758E-01	5.3E-15	7.6E-05	9.6E-06	9	0.86	0
CONT1-20	-4.33578907E+00	2.9E-15	2.9E-05	3.7E-06	10	5.26	0
CONT-201	2.08647467E-01	6.2E-15	6.8E-05	3.1E-06	17	8.98	0
CONT-300	2.16539781E-01	2.0E-14	6.4E-05	2.7E-05	29	39.68	-17
CVXQP1_L	1.08704800E+08	1.4E-13	2.2E-05	9.9E-07	21	28.58	0
CVXQP1_M	1.08751157E+06	1.8E-15	2.4E-05	3.5E-03	15	0.24	0
CVXQP1_S	1.15907184E+04	8.9E-16	1.4E-05	1.4E-04	14	0.01	0
CVXQP2_L	8.18424583E+07	2.2E-12	5.1E-05	8.8E-04	17	7.69	0
CVXQP2_M	8.20155431E+05	1.8E-15	4.8E-05	1.1E-08	16	0.13	0
CVXQP2_S	8.12094050E+03	8.9E-16	3.5E-05	7.7E-04	16	0.01	0
CVXQP3_L	1.15711104E+08	2.8E-06	2.2E-02	3.5E+00	36	459.07	0
CVXQP3_M	1.36282874E+06	1.8E-15	1.3E-05	4.0E-07	21	0.58	0
CVXQP3_S	1.19434324E+04	3.4E-10	1.3E-05	1.2E-05	16	0.01	0
DEGDIAG	1.66670174E+04	0.0E+00	3.3E-16	1.3E-04	20	1.53	0
DEGENQP	5.69681246E-01	0.0E+00	3.0E-07	9.3E-06	7	3.78	0
DEGTRID	-9.99994997E+04	0.0E+00	2.1E-07	5.6E-04	19	2.46	0
DEGTRID2	-9.99991120E+04	0.0E+00	2.9E-16	8.3E-06	22	2.85	0
DEGTRIDL	5.00438860E-01	1.8E-08	6.6E-07	8.8E-04	8	1.24	0
DPKLO1	3.70096218E-01	7.1E-15	3.6E-05	3.0E-16	1	0.00	0
DTOC3	2.35216400E+02	2.4E-15	1.6E-04	6.2E-14	1	0.02	0
DUAL1	3.50638467E-02	4.4E-16	1.0E-06	5.5E-06	16	0.01	0
DUAL2	3.37455550E-02	0.0E+00	3.8E-07	3.7E-06	14	0.01	0
DUAL3	1.35835540E-01	0.0E+00	4.5E-07	9.5E-06	13	0.01	0
DUAL4	7.46161454E-01	0.0E+00	3.3E-06	1.4E-05	12	0.01	0
DUALC1	6.15525169E+03	1.1E-16	5.2E-06	7.4E-08	28	0.02	0
DUALC2	3.55130639E+03	1.1E-16	6.8E-06	2.7E-07	18	0.02	0
DUALC5	4.27232570E+02	0.0E+00	5.3E-06	6.5E-07	19	0.02	0
DUALC8	1.83093613E+04	2.2E-16	9.4E-06	5.0E-06	27	0.05	0
EXDATA	-1.41842670E+02	1.4E-13	1.0E-04	8.3E-06	36	12.51	0
GENHS28	9.27173694E-01	5.6E-16	3.1E-06	1.2E-16	1	0.00	0
GOULDQP2	1.59761801E-12	4.4E-16	2.3E-02	4.7E-07	3	0.22	0
GOULDQP3	6.37165504E-05	4.4E-16	2.3E-02	4.7E-07	3	0.29	0

Table A.2: Complete results for option T1 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
HS21	-9.99599993E+01	0.0E+00	2.0E-05	6.7E-07	15	0.00	0
HS35	1.11123545E-01	0.0E+00	1.3E-05	1.2E-05	11	0.00	0
HS35MOD	2.50006324E-01	0.0E+00	1.5E-05	1.3E-05	12	0.00	0
HS51	8.50000000E+00	0.0E+00	4.0E+00	0.0E+00	0	0.00	0
HS52	5.32664756E+00	4.4E-16	5.2E-06	1.5E-15	1	0.00	0
HS53	4.09302326E+00	1.1E-16	5.8E-06	7.1E-05	5	0.00	0
HS76	-4.68181804E+00	0.0E+00	2.1E-05	7.5E-08	15	0.00	0
HS118	6.64820457E+02	0.0E+00	7.7E-04	4.7E-07	21	0.00	0
HS268	2.39661531E-05	0.0E+00	4.0E-05	4.6E-05	21	0.00	0
HUES-MOD	3.48244898E+07	4.5E-12	9.5E-02	2.7E-04	17	0.11	0
HUESTIS	3.48298240E+09	9.1E-13	9.5E-02	8.9E-05	16	0.00	0
KSIP	5.75814904E-01	0.0E+00	4.0E-06	9.6E-06	161	0.96	0
LASER	2.40960136E+06	2.0E-07	3.5E-03	1.6E-04	14	0.07	0
LEUVEN1	-1.52429007E+07	3.3E-07	1.8E-02	4.2E-05	104	1.63	0
LEUVEN2	-1.41465394E+07	3.5E-07	1.8E-02	1.5E-04	114	1.63	0
LEUVEN7	6.94549717E+02	3.2E-07	4.1E-05	2.6E-03	31	0.38	0
LISWET1	7.22905545E+00	0.0E+00	1.1E-05	2.6E-03	19	0.12	0
LISWET2	5.00521666E+00	0.0E+00	1.0E-05	2.9E-03	19	0.13	0
LISWET3	4.99778856E+00	0.0E+00	1.0E-05	4.8E-06	35	0.23	0
LISWET4	4.99782946E+00	0.0E+00	1.0E-05	5.7E-06	47	0.32	0
LISWET5	4.99783366E+00	2.0E-06	2.7E-05	1.7E-06	35	0.23	0
LISWET6	4.99791792E+00	0.0E+00	1.1E-05	8.1E-06	42	0.28	0
LISWET7	9.98980786E+01	0.0E+00	6.4E-06	1.4E-03	19	0.12	0
LISWET8	1.43130575E+02	5.7E-09	1.1E-05	1.7E-08	36	0.24	0
LISWET9	3.92920181E+02	9.4E-07	9.5E-06	1.3E-05	43	0.28	0
LISWET10	9.89649573E+00	0.0E+00	1.3E-05	2.9E-06	33	0.22	0
LISWET12	3.47519198E+02	3.2E-08	1.2E-05	1.4E-04	31	0.20	0
LOTSCHD	2.39841591E+03	1.8E-14	2.7E-04	6.7E-05	12	0.01	0
MOSARQP1	-3.82140973E+03	0.0E+00	1.5E-05	4.2E-06	30	0.21	0
MOSARQP2	-5.05259076E+03	0.0E+00	1.1E-05	2.4E-04	25	0.17	0
MPC1	-2.32620447E+07	1.1E-12	1.8E-02	3.8E-04	40	1.25	0
MPC2	-1.50331477E+07	8.3E-08	1.6E-02	1.9E-05	42	0.61	0
MPC3	-1.50295469E+07	9.5E-09	1.6E-02	5.6E-06	41	0.61	0
MPC4	-1.50334607E+07	1.4E-07	1.6E-02	3.4E-05	43	0.62	0
MPC5	-1.50334851E+07	1.8E-07	1.6E-02	2.4E-05	43	0.63	0
MPC6	-1.50335373E+07	9.1E-13	1.6E-02	3.1E-06	54	0.78	0
MPC7	-1.50335567E+07	8.0E-13	1.6E-02	7.1E-06	52	0.76	0
MPC8	-1.50335771E+07	8.5E-13	1.6E-02	5.6E-06	46	0.67	0
MPC9	-1.50335693E+07	8.2E-13	1.6E-02	2.7E-06	46	0.67	0
MPC10	-1.50335538E+07	6.8E-13	1.6E-02	8.3E-06	47	0.70	0
MPC11	-1.50301194E+07	9.1E-13	1.6E-02	9.3E-06	53	0.78	0
MPC12	-1.50334620E+07	2.4E-07	1.6E-02	2.3E-05	48	0.70	0
MPC13	-1.50335763E+07	7.5E-13	1.6E-02	7.3E-06	49	0.72	0
MPC14	-1.50335392E+07	2.1E-07	1.6E-02	8.0E-06	48	0.71	0
MPC15	-1.50335863E+07	8.0E-13	1.6E-02	7.1E-06	47	0.78	0
MPC16	-1.50335836E+07	3.2E-07	1.1E-01	2.0E-04	47	0.69	0
POWELL20	5.20895828E+10	2.0E-08	7.5E-02	2.8E-06	90	2.69	0
PRIMAL1	-3.49386286E-02	0.0E+00	3.7E-07	6.0E-06	27	0.08	0
PRIMAL2	-3.37153965E-02	0.0E+00	3.6E-07	3.0E-06	26	0.09	0
PRIMAL3	-1.35705279E-01	0.0E+00	1.5E-06	5.2E-06	24	0.22	0
PRIMAL4	-7.46083214E-01	0.0E+00	8.4E-06	8.4E-06	22	0.11	0
PRIMALC1	-6.12365722E+03	0.0E+00	9.7E-02	5.4E-07	21	0.01	0
PRIMALC2	-3.55019864E+03	0.0E+00	4.7E-02	2.7E-07	23	0.01	0
PRIMALC5	-4.27232094E+02	0.0E+00	4.6E-03	8.5E-07	17	0.01	0
PRIMALC8	-1.73353223E+04	0.0E+00	2.6E-01	1.2E-07	20	0.02	0
Q25FV47	1.37444479E+07	1.7E-11	1.5E-02	1.4E-07	172	3.21	0
QADLITTL	4.80318859E+05	1.1E-13	3.9E-03	1.8E-05	31	0.01	0
QAFIRO	-1.59077156E+00	1.0E-15	2.5E-04	5.5E-05	26	0.01	0
QPBAND	-3.14328159E+00	0.0E+00	1.8E-05	4.9E-05	9	0.00	0
QBANDM	1.63523446E+04	1.9E-09	8.4E-03	4.8E-06	57	0.10	0
QBEACONF	1.64712874E+05	2.6E-11	2.8E-02	1.3E-03	29	0.04	0
QBORE3D	3.12591917E+03	1.5E-08	6.2E-02	2.5E-04	43	0.05	0
QBRANDY	2.83751565E+04	2.0E-12	3.5E-02	9.1E-05	57	0.07	0
QCAPRI	6.67933017E+07	3.5E-08	6.1E-02	6.4E-03	124	0.23	0
QE226	2.12657259E+02	2.6E-06	1.1E-03	6.7E-06	95	0.16	0
QETAMACR	8.67603696E+04	1.6E-09	4.6E-04	4.1E-06	76	0.27	0
QFFFFF80	8.78090621E+05	7.3E-11	2.5E+00	6.3E-06	146	0.73	0
QFORPLAN	7.45663162E+09	9.3E-10	8.2E-02	6.5E-05	56	0.10	0
QGFRDXPN	1.00790586E+11	7.7E-08	7.0E-01	6.6E-06	86	0.23	0
QGROW7	-1.65631181E+07	6.3E-06	3.5E+00	6.4E-06	37	0.05	0
QGROW15	-3.82560279E+07	1.1E-10	3.6E+00	6.7E-06	40	0.11	0
QGROW22	-5.58998667E+07	2.0E-07	3.6E+00	9.1E-07	42	0.17	0

Table A.2: Complete results for option T1 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
QISRAEL	2.53481531E+07	0.0E+00	2.2E-02	8.4E-06	131	0.15	0
QPCBLEND	-7.83230941E-03	1.3E-18	2.1E-07	5.8E-06	42	0.02	0
QPCBOEI1	1.15039142E+07	4.2E-09	4.7E-03	1.3E-03	83	0.21	0
QPCBOEI2	8.17196355E+06	5.1E-12	8.8E-03	2.7E-04	65	0.07	0
QPCSTAIR	6.20439170E+06	3.6E-14	2.5E-03	2.3E-05	52	0.16	0
QPILOTNO	4.73232880E+06	2.0E-10	1.9E-01	4.2E-07	199	2.06	0
QPTEST	4.37187504E+00	0.0E+00	7.6E-06	4.1E-08	13	0.00	0
QRECIPE	-2.66615999E+02	3.6E-15	4.5E+00	4.3E-06	60	0.04	0
QSC205	-5.78739140E-03	4.4E-16	2.4E-05	1.1E-05	53	0.04	0
QSCAGR25	2.01737938E+08	7.3E-12	2.3E-01	7.6E-07	40	0.07	0
QSCAGR7	2.68659505E+07	1.2E-12	3.9E-02	3.6E-04	36	0.02	0
QSCFXM1	1.68829367E+07	9.2E-06	1.6E-01	2.2E-05	145	0.28	0
QSCFXM2	2.77764417E+07	1.1E-11	1.6E-01	1.1E-05	188	0.77	0
QSCFXM3	3.08166697E+07	5.5E-12	1.6E-01	5.5E-06	215	1.31	0
QSCORPIO	1.88050955E+03	6.7E-16	2.7E-05	7.8E-09	48	0.06	0
QSCRS8	9.04573560E+02	5.3E-14	2.1E-03	4.1E-05	76	0.24	0
QSCSD1	8.66782266E+00	2.2E-16	5.3E-06	1.5E-04	20	0.03	0
QSCSD6	5.08082634E+01	4.7E-16	1.2E-05	6.6E-06	27	0.08	0
QSCSD8	9.40763621E+02	4.0E-06	2.2E-04	7.5E-05	28	0.17	0
QSCTAP1	1.41586115E+03	2.2E-16	1.0E-04	6.4E-06	93	0.16	0
QSCTAP2	1.73502688E+03	2.2E-16	1.0E-05	7.6E-06	103	0.68	0
QSCTAP3	1.43875546E+03	2.2E-16	1.0E-05	1.0E-05	105	0.95	0
QSEBA	8.14818490E+07	1.3E-12	7.3E-02	5.7E-05	72	0.21	0
QSHARE1B	7.88369052E+05	6.7E-11	1.4E+00	9.4E-05	89	0.07	0
QSHARE2B	1.17036918E+04	1.5E-12	6.0E-04	2.3E-05	58	0.03	0
QSHELL	1.57263684E+12	5.8E-11	2.8E+00	4.6E-04	73	0.29	0
QSHIP04L	2.42001555E+06	1.1E-06	8.0E-04	8.3E-03	43	0.19	0
QSHIP04S	2.42499368E+06	1.5E-07	8.0E-04	9.9E-04	45	0.14	0
QSHIP08L	2.37604062E+06	1.7E-08	4.0E-04	1.4E-04	50	1.13	0
QSHIP08S	2.38572886E+06	8.0E-09	4.0E-04	4.6E-03	44	0.37	0
QSHIP12L	3.01887658E+06	2.0E-10	9.2E-04	3.0E-05	49	1.70	0
QSHIP12S	3.05696226E+06	3.0E-09	9.2E-04	2.9E-03	44	0.44	0
QSIERRA	2.37504582E+07	4.1E-07	2.1E-02	7.6E-04	46	0.37	0
QSTAIR	7.98545276E+06	2.8E-14	2.5E-03	7.8E-05	56	0.15	0
QSTANDAT	6.41183910E+03	4.6E-08	9.8E-03	1.9E-06	77	0.21	0
S268	2.39661531E-05	0.0E+00	4.0E-05	4.6E-05	21	0.00	0
STADAT1	-2.85240734E+07	5.3E-06	5.3E-02	1.7E-05	34	0.44	0
STADAT2	-3.26236345E+01	0.0E+00	1.4E-04	1.4E-06	38	0.53	0
STADAT3	-3.57638251E+01	0.0E+00	1.4E-04	4.4E-05	74	2.07	0
STCQP1	3.67100485E+05	7.1E-15	2.0E-05	3.3E-04	14	3.44	0
STCQP2	3.71892759E+04	1.8E-15	2.2E-05	5.6E-04	14	3.39	0
TAME	0.00000000E+00	0.0E+00	5.0E-06	3.6E-07	6	0.00	0
UBH1	7.28739570E+01	1.9E-13	1.1E-02	5.0E-04	13	0.25	0
VALUES	-1.39607735E+00	1.8E-16	3.3E-06	7.0E-06	21	0.02	0
YAO	1.97704616E+02	2.7E-08	4.8E-06	5.1E-08	22	0.15	0
ZECEVIC2	-4.12499887E+00	0.0E+00	1.8E-05	2.4E-06	13	0.00	0

Table A.3: Complete results for option T2

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
A0ENDNDL	2.57256768E-04	6.9E-13	1.0E-04	5.1E-08	13	0.98	0
A0ENINDL	2.57256517E-04	6.8E-14	1.0E-04	5.1E-08	13	0.96	0
A0ENSNDL	1.76112141E+02	7.7E-10	1.0E-04	1.2E-01	53	53.11	-16
A0ESDNDL	2.57256748E-04	4.6E-13	1.0E-04	5.1E-08	13	0.95	0
A0ESINDL	2.57256468E-04	1.5E-13	1.0E-04	5.1E-08	13	0.95	0
A2ENDNDL	2.58321253E-02	5.7E-13	1.0E-04	2.5E-05	15	1.09	0
A2ENINDL	2.53317241E-02	1.5E-13	1.0E-04	2.5E-05	15	1.11	0
A2ENSNDL	1.08042806E+04	1.5E-07	1.1E-04	3.5E+00	59	3.77	-17
A2ESDNDL	2.58321344E-02	2.2E-13	1.0E-04	2.5E-05	15	1.17	0
A2ESINDL	2.53317139E-02	2.4E-13	1.0E-04	2.5E-05	15	1.09	0
A5ENINDL	9.86505861E-03	1.2E-13	1.0E-04	3.8E-06	16	1.16	0
A5ENSNDL	3.94635921E+02	6.3E-08	1.0E-04	1.6E-01	40	13.96	-16
A5ESDNDL	9.56850007E-03	1.4E-13	1.0E-04	3.8E-06	16	1.15	0
A5ESINDL	9.86505950E-03	1.4E-13	1.0E-04	3.8E-06	16	1.17	0
A5ESSNDL	7.35675125E+01	1.5E-10	1.0E-04	6.8E-02	68	66.79	-16
AUG2D	1.68741175E+06	1.1E-14	3.5E-04	1.9E-12	1	0.08	0
AUG2DC	1.81836807E+06	1.1E-14	3.5E-04	1.9E-12	1	0.08	0
AUG2DCQP	6.49813474E+06	2.8E-06	6.5E-04	1.8E-04	35	2.71	0
AUG2DQP	6.23701209E+06	2.1E-14	6.6E-04	8.0E-04	35	2.73	0
AUG3D	2.45614860E+04	2.6E-15	5.8E-05	1.4E-14	1	0.21	0
AUG3DC	2.76540711E+04	2.7E-15	5.6E-05	2.2E-14	1	0.20	0

Table A.3: Complete results for option T2 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
AUG3DCQP	6.15603839E+04	2.8E-06	8.3E-05	7.0E-06	25	4.96	0
AUG3DQP	5.42290192E+04	3.6E-15	8.5E-05	8.5E-05	24	4.78	0
BOYD1	-6.17352196E+07	6.3E-03	3.4E-04	8.0E-05	53	16.45	0
BOYD2	2.12601307E+01	1.8E-02	5.9E-05	1.6E-05	52	70.21	0
CONT5-QP	1.25223924E-02	1.3E-11	9.4E-06	9.1E-06	17	10.97	0
CONT-050	-4.56349265E+00	2.7E-15	3.5E-05	1.6E-06	8	0.19	0
CONT1-10	-4.60198454E+00	3.3E-15	3.4E-05	1.0E-05	7	0.84	0
CONT-101	2.01605453E-01	5.3E-15	7.6E-05	9.0E-05	10	1.23	0
CONT1-20	-4.32019834E+00	2.9E-15	2.9E-05	6.5E-06	7	4.68	0
CONT-201	2.08385709E-01	6.8E-07	6.9E-05	1.1E-06	12	7.95	0
CONT-300	2.12203367E-01	7.1E-15	6.6E-05	1.1E-07	12	21.53	0
CVXQP1_L	1.08704800E+08	2.4E-12	2.2E-05	3.4E-06	13	18.10	0
CVXQP1_M	1.08751157E+06	1.5E-09	2.4E-05	1.0E-03	10	0.19	0
CVXQP1_S	1.15907184E+04	8.9E-16	1.4E-05	9.7E-06	9	0.01	0
CVXQP2_L	8.18424583E+07	1.8E-15	5.1E-05	2.2E-04	12	5.97	0
CVXQP2_M	8.20155431E+05	1.8E-15	4.8E-05	9.9E-08	10	0.11	0
CVXQP2_S	8.12094048E+03	1.8E-15	3.5E-05	2.0E-06	12	0.01	0
CVXQP3_L	1.15711104E+08	2.1E-07	1.2E-05	1.3E-01	11	55.89	0
CVXQP3_M	1.36282874E+06	1.8E-15	1.3E-05	9.8E-06	14	0.43	0
CVXQP3_S	1.19434322E+04	3.5E-11	1.3E-05	5.0E-08	11	0.01	0
DEGDIAG	1.66666244E+04	0.0E+00	3.3E-16	2.7E-05	15	2.01	0
DEGENQP	1.50281474E-01	0.0E+00	4.3E-07	3.3E-06	6	5.04	0
DEGTRID	-9.99994993E+04	0.0E+00	4.0E-06	1.4E-03	13	3.06	0
DEGTRID2	-9.99992933E+04	0.0E+00	3.3E-16	4.2E-06	16	3.44	0
DEGTRIDL	5.00172150E-01	1.5E-07	9.7E-08	3.4E-04	7	1.66	0
DPKLO1	3.70096218E-01	7.1E-15	3.6E-05	3.0E-16	1	0.00	0
DTOC3	2.35216400E+02	2.4E-15	1.6E-04	6.2E-14	1	0.02	0
DUAL1	3.50500401E-02	0.0E+00	1.1E-06	4.1E-06	12	0.01	0
DUAL2	3.37357361E-02	4.4E-16	4.0E-06	1.0E-06	11	0.01	0
DUAL3	1.35779410E-01	6.7E-16	4.3E-07	3.1E-06	10	0.02	0
DUAL4	7.46091324E-01	2.2E-16	4.2E-07	1.5E-06	10	0.01	0
DUALC1	6.15525169E+03	1.1E-16	5.6E-06	1.5E-06	26	0.03	0
DUALC2	3.55130639E+03	1.1E-16	5.1E-06	1.5E-06	18	0.02	0
DUALC5	4.27232568E+02	0.0E+00	4.3E-06	3.3E-08	16	0.03	0
DUALC8	1.83093612E+04	2.2E-16	5.0E-06	1.5E-07	21	0.05	0
EXDATA	-1.41843058E+02	1.1E-14	1.0E-04	2.6E-06	20	7.62	0
GENHS28	9.27173694E-01	5.6E-16	3.1E-06	1.2E-16	1	0.00	0
GOULDQP2	1.59760833E-12	4.4E-16	2.3E-02	4.7E-07	3	0.34	0
GOULDQP3	6.37116173E-05	4.4E-16	2.3E-02	4.7E-07	3	0.41	0
HS21	-9.99599994E+01	0.0E+00	2.0E-05	6.2E-07	12	0.00	0
HS35	1.11111820E-01	0.0E+00	1.3E-05	7.1E-07	9	0.00	0
HS35MOD	2.50003510E-01	0.0E+00	1.5E-05	7.0E-06	10	0.00	0
HS51	8.50000000E+00	0.0E+00	4.0E+00	0.0E+00	0	0.00	0
HS52	5.32664756E+00	4.4E-16	5.2E-06	1.5E-15	1	0.00	0
HS53	4.09302326E+00	1.1E-16	6.6E-06	1.2E-05	5	0.00	0
HS76	-4.68181549E+00	0.0E+00	2.1E-05	1.3E-06	11	0.00	0
HS118	6.64820582E+02	0.0E+00	7.7E-04	1.3E-05	13	0.00	0
HS268	2.13802232E-05	0.0E+00	4.0E-05	4.1E-05	13	0.00	0
HUES-MOD	3.48244898E+07	1.0E-11	9.5E-02	2.8E-04	12	0.14	0
HUESTIS	3.48298240E+09	6.8E-13	9.5E-02	6.5E-06	12	0.01	0
KSIP	5.75824520E-01	0.0E+00	4.0E-06	9.1E-06	50	0.43	0
LASER	2.40960136E+06	1.9E-07	3.5E-03	2.7E-04	9	0.07	0
LEUVEN1	-1.52429007E+07	9.3E-10	1.8E-02	6.6E-06	70	1.37	0
LEUVEN2	-1.41465394E+07	3.5E-07	1.8E-02	9.3E-05	90	1.71	0
LEUVEN7	6.94547162E+02	0.0E+00	4.1E-05	2.9E-05	24	0.36	0
LISWET1	7.22928903E+00	0.0E+00	1.1E-05	2.0E-03	13	0.14	0
LISWET2	5.00619101E+00	0.0E+00	1.1E-05	2.4E-03	13	0.13	0
LISWET3	4.99780105E+00	0.0E+00	1.0E-05	6.2E-06	25	0.26	0
LISWET4	4.99785265E+00	0.0E+00	1.0E-05	9.9E-06	27	0.28	0
LISWET5	4.99785221E+00	0.0E+00	2.7E-05	5.4E-06	25	0.26	0
LISWET6	4.99792268E+00	0.0E+00	1.1E-05	6.7E-06	27	0.28	0
LISWET7	9.99127782E+01	0.0E+00	6.5E-06	5.5E-03	13	0.13	0
LISWET8	1.43130575E+02	2.4E-07	1.1E-05	7.3E-09	30	0.32	0
LISWET9	3.92920162E+02	5.3E-08	9.5E-06	9.5E-08	31	0.32	0
LISWET10	9.89651570E+00	0.0E+00	1.3E-05	6.4E-06	25	0.27	0
LISWET12	3.47519044E+02	2.1E-06	1.2E-05	3.4E-05	19	0.19	0
LOTSCHD	2.39841586E+03	3.9E-14	2.7E-04	9.0E-06	9	0.01	0
MOSARQP1	-3.82140972E+03	0.0E+00	1.5E-05	4.3E-06	20	0.21	0
MOSARQP2	-5.05259142E+03	0.0E+00	1.1E-05	1.2E-04	17	0.19	0
MPC1	-2.32620447E+07	1.6E-12	1.8E-02	1.6E-06	29	1.23	0
MPC2	-1.50331477E+07	1.1E-12	1.6E-02	6.4E-05	26	0.51	0
MPC3	-1.50295469E+07	9.1E-13	1.6E-02	8.2E-05	27	0.51	0

Table A.3: Complete results for option T2 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
MPC4	-1.50334607E+07	1.0E-12	1.6E-02	1.6E-06	29	0.58	0
MPC5	-1.50334851E+07	5.6E-08	1.6E-02	7.9E-06	29	0.56	0
MPC6	-1.50335373E+07	3.2E-07	1.6E-02	3.3E-06	30	0.59	0
MPC7	-1.50335567E+07	7.7E-13	1.6E-02	3.4E-06	31	0.60	0
MPC8	-1.50335771E+07	3.5E-07	1.6E-02	5.0E-06	26	0.50	0
MPC9	-1.50335693E+07	1.0E-12	1.6E-02	1.8E-06	27	0.53	0
MPC10	-1.50335538E+07	1.3E-12	1.6E-02	1.5E-06	28	0.54	0
MPC11	-1.50301194E+07	6.8E-13	1.6E-02	5.8E-06	32	0.66	0
MPC12	-1.50334620E+07	2.8E-07	5.8E-02	1.2E-05	29	0.59	0
MPC13	-1.50335763E+07	8.2E-13	1.6E-02	3.5E-07	31	0.59	0
MPC14	-1.50335392E+07	1.0E-12	2.0E-02	3.9E-06	29	0.58	0
MPC15	-1.50335863E+07	9.2E-08	1.6E-02	1.8E-06	27	0.53	0
MPC16	-1.50335836E+07	3.3E-07	1.1E-01	1.1E-04	26	0.51	0
POWELL20	5.20895826E+10	2.2E-08	7.5E-02	1.4E-01	71	3.57	0
PRIMAL1	-3.48581404E-02	0.0E+00	3.7E-07	8.2E-06	19	0.06	0
PRIMAL2	-3.36657779E-02	0.0E+00	3.6E-07	6.4E-06	18	0.08	0
PRIMAL3	-1.35717681E-01	0.0E+00	1.5E-06	3.3E-06	18	0.19	0
PRIMAL4	-7.46085415E-01	0.0E+00	8.4E-06	6.2E-06	17	0.11	0
PRIMALC1	-6.12365684E+03	0.0E+00	9.7E-02	1.7E-06	17	0.02	0
PRIMALC2	-3.55019769E+03	0.0E+00	4.7E-02	4.2E-06	17	0.02	0
PRIMALC5	-4.27230845E+02	0.0E+00	4.6E-03	4.9E-06	12	0.01	0
PRIMALC8	-1.73353222E+04	0.0E+00	2.6E-01	2.3E-07	15	0.03	0
Q25FV47	1.37444479E+07	1.8E-10	1.5E-02	2.7E-07	103	2.20	0
QADLITTL	4.80318859E+05	2.3E-13	3.9E-03	3.4E-06	21	0.01	0
QAFIRO	-1.59077758E+00	2.5E-15	2.5E-04	1.8E-05	16	0.01	0
QPBAND	-3.14333203E+00	0.0E+00	2.0E-05	6.6E-07	8	0.00	0
QBANDM	1.63523446E+04	2.5E-11	8.4E-03	1.9E-06	33	0.08	0
QBEACONF	1.64712873E+05	8.8E-11	2.8E-02	9.7E-04	17	0.03	0
QBORE3D	3.12591940E+03	1.6E-07	6.2E-02	3.2E-05	27	0.05	0
QBRANDY	2.83751565E+04	2.9E-12	3.5E-02	4.7E-05	38	0.06	0
QCAPRI	6.67933017E+07	2.1E-08	6.1E-02	5.6E-02	113	0.31	0
QE226	2.12657259E+02	4.1E-12	1.1E-03	2.7E-06	63	0.15	0
QETAMACR	8.67603696E+04	1.3E-09	4.6E-04	2.2E-06	53	0.24	0
QFFFFF80	8.78090621E+05	1.2E-10	2.5E+00	1.1E-06	96	0.64	0
QFORPLAN	7.45663162E+09	9.5E-10	8.2E-02	8.7E-04	38	0.10	0
QGFRDXPN	1.00790586E+11	8.2E-12	7.0E-01	4.9E-06	62	0.27	0
QGROW7	-1.65631181E+07	1.2E-10	3.5E+00	9.4E-06	23	0.04	0
QGROW15	-3.82560279E+07	1.5E-10	3.6E+00	2.4E-06	24	0.10	0
QGROW22	-5.58998667E+07	1.2E-10	3.6E+00	8.1E-06	26	0.15	0
QISRAEL	2.53481531E+07	0.0E+00	2.2E-02	2.8E-07	90	0.15	0
QPCBLEND	-7.82843941E-03	3.5E-18	2.1E-07	5.2E-06	26	0.02	0
QPCBOEI1	1.15039142E+07	1.2E-09	4.7E-03	4.1E-04	61	0.22	0
QPCBOEI2	8.17196355E+06	2.5E-11	8.8E-03	1.0E-04	48	0.07	0
QPCSTAIR	6.20439170E+06	2.8E-14	2.5E-03	8.5E-06	34	0.13	0
QPILOTNO	4.73232880E+06	3.1E-06	1.9E-01	6.9E-05	127	1.84	0
QPTEST	4.37187711E+00	0.0E+00	7.7E-06	2.1E-06	10	0.00	0
QRECIPE	-2.66615998E+02	3.6E-15	7.5E-01	8.4E-06	42	0.04	0
QSC205	-5.78571097E-03	8.9E-16	2.5E-05	1.1E-05	28	0.04	0
QSCAGR25	2.01737938E+08	4.4E-12	2.3E-01	7.9E-08	23	0.06	0
QSCAGR7	2.68659505E+07	1.3E-10	3.9E-02	1.0E-04	23	0.02	0
QSCFXM1	1.68829367E+07	7.3E-12	1.6E-01	1.5E-05	98	0.27	0
QSCFXM2	2.77764417E+07	1.9E-12	1.6E-01	3.9E-06	131	0.77	0
QSCFXM3	3.08166697E+07	6.2E-09	1.6E-01	1.8E-06	138	1.20	0
QSCORPIO	1.88050956E+03	1.7E-12	2.7E-05	1.1E-07	29	0.06	0
QSCRS8	9.04573515E+02	9.4E-14	2.1E-03	9.4E-06	49	0.24	0
QSCSD1	8.66672764E+00	4.5E-08	5.5E-06	6.2E-07	15	0.04	0
QSCSD6	5.08082668E+01	6.7E-16	1.2E-05	3.1E-06	20	0.09	0
QSCSD8	9.40763586E+02	3.6E-15	2.2E-04	1.0E-06	20	0.18	0
QSCTAP1	1.41586118E+03	2.2E-16	1.0E-04	6.3E-06	54	0.15	0
QSCTAP2	1.73502708E+03	2.2E-16	1.0E-05	7.4E-06	55	0.55	0
QSCTAP3	1.43875526E+03	2.2E-16	1.0E-05	5.8E-06	57	0.75	0
QSEBA	8.14818490E+07	4.3E-12	7.3E-02	1.9E-07	58	0.26	0
QSHARE1B	7.88369053E+05	7.4E-11	1.4E+00	9.5E-05	59	0.07	0
QSHARE2B	1.17036917E+04	3.6E-15	6.0E-04	4.7E-06	41	0.03	0
QSHELL	1.57263684E+12	1.2E-10	2.8E+00	9.3E-04	54	0.34	0
QSHIP04L	2.42001553E+06	4.9E-11	8.0E-04	9.2E-07	18	0.13	0
QSHIP04S	2.42499367E+06	3.1E-10	8.0E-04	3.2E-06	19	0.09	0
QSHIP08L	2.37604062E+06	4.4E-07	4.0E-04	3.3E-03	24	0.67	0
QSHIP08S	2.38572885E+06	4.4E-10	4.0E-04	4.8E-04	26	0.31	0
QSHIP12L	3.01887658E+06	3.5E-09	9.2E-04	2.6E-05	25	1.12	0
QSHIP12S	3.05696225E+06	2.2E-10	9.2E-04	1.8E-03	27	0.39	0
QSIERRA	2.37504582E+07	5.0E-08	2.1E-02	3.1E-04	34	0.44	0

Table A.3: Complete results for option T2 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
QSTAIR	7.98545276E+06	2.8E-14	2.5E-03	3.6E-05	36	0.13	0
QSTANDAT	6.41183937E+03	6.2E-08	9.8E-03	4.1E-06	53	0.23	0
S268	2.13802232E-05	0.0E+00	4.0E-05	4.1E-05	13	0.00	0
STADAT1	-2.85240734E+07	3.3E-06	5.3E-02	2.4E-05	31	0.63	0
STADAT2	-3.26236702E+01	0.0E+00	1.4E-04	1.1E-06	29	0.60	0
STADAT3	-3.57669313E+01	0.0E+00	1.4E-04	1.4E-05	66	4.43	0
STCQP1	3.67100485E+05	7.1E-15	2.0E-05	6.5E-05	9	2.53	0
STCQP2	3.71892743E+04	3.6E-15	2.1E-05	5.1E-05	10	2.63	0
TAME	0.00000000E+00	0.0E+00	5.0E-06	3.6E-07	6	0.01	0
UBH1	7.28904158E+01	2.0E-13	1.1E-02	1.2E-04	9	0.27	0
VALUES	-1.39569337E+00	4.4E-16	3.4E-06	9.8E-06	14	0.02	0
YAO	1.97707087E+02	0.0E+00	4.8E-06	3.4E-03	14	0.15	0
ZECEVIC2	-4.12499990E+00	0.0E+00	1.8E-05	1.0E-07	9	0.00	0

Table A.4: Complete results for option P2

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
A0ENDNDL	2.50979312E-04	8.6E-13	1.0E-04	5.0E-08	18	1.35	0
A0ENINDL	3.22303928E-02	7.4E-06	1.0E-04	6.7E-06	13	1.04	0
A0ENSNDL	1.35441207E-03	1.8E-06	1.0E-04	5.6E-07	37	4.29	0
A0ESDNDL	1.07195492E-02	2.2E-13	1.0E-04	2.2E-06	16	1.22	0
A0ESINDL	7.82082274E-03	2.8E-14	1.0E-04	1.6E-06	16	1.25	0
A2ENDNDL	3.56522130E-03	2.6E-13	1.0E-04	8.9E-07	18	1.35	0
A2ENINDL	3.04595791E-02	1.4E-13	1.0E-04	7.6E-06	12	0.97	0
A2ENSNDL	3.18027910E-02	2.2E-10	1.0E-04	7.4E-05	18	1.40	0
A2ESDNDL	3.21523756E-02	1.6E-13	1.0E-04	8.0E-06	16	1.22	0
A2ESINDL	1.26605190E-04	1.3E-13	1.0E-04	2.7E-08	16	1.21	0
A5ENINDL	6.00399064E-04	3.1E-13	1.0E-04	1.7E-07	13	1.02	0
A5ENSNDL	8.69969917E+01	1.7E-08	1.0E-04	3.5E-02	17	1.28	-17
A5ESDNDL	6.96469051E-03	1.9E-13	1.0E-04	2.8E-06	16	1.23	0
A5ESINDL	2.45572954E-02	1.7E-13	1.0E-04	1.1E-05	13	1.05	0
A5ESSNDL	8.69979589E+01	5.5E-08	1.0E-04	3.5E-02	17	1.29	-17
AUG2D	1.68741175E+06	1.1E-14	3.5E-04	1.9E-12	1	0.09	0
AUG2DC	1.81836807E+06	1.1E-14	3.5E-04	1.9E-12	1	0.09	0
AUG2DCQP	6.49813474E+06	2.1E-14	6.5E-04	3.7E-06	32	2.74	0
AUG2DQP	6.23701203E+06	4.9E-12	6.6E-04	4.5E-07	30	2.51	0
AUG3D	2.45614860E+04	2.6E-15	5.8E-05	1.4E-14	1	0.25	0
AUG3DC	2.76540711E+04	2.7E-15	5.6E-05	2.2E-14	1	0.25	0
AUG3DCQP	6.15603838E+04	1.1E-12	8.3E-05	1.3E-06	20	4.71	0
AUG3DQP	5.42289966E+04	1.2E-06	8.5E-05	6.1E-07	24	5.12	0
BOYD1	-6.17352196E+07	3.6E-02	3.4E-04	7.4E-05	49	17.31	0
BOYD2	2.12595755E+01	4.9E-02	5.9E-05	6.8E-04	82	121.33	0
CONT5-QP	1.24805284E-02	1.2E-11	9.1E-06	6.6E-06	17	12.42	0
CONT-050	-4.56351005E+00	3.1E-15	3.5E-05	1.6E-08	9	0.21	0
CONT1-10	-4.63394405E+00	3.4E-14	3.5E-05	1.5E-06	8	1.03	0
CONT-101	2.01573825E-01	7.1E-15	7.6E-05	6.8E-05	8	1.14	0
CONT1-20	-4.34928258E+00	1.8E-13	2.8E-05	8.5E-06	7	5.30	0
CONT-201	2.08385948E-01	7.1E-15	6.9E-05	2.1E-07	12	8.91	0
CONT-300	2.12203396E-01	7.1E-15	6.6E-05	7.0E-07	12	23.71	0
CVXQP1_L	1.08704800E+08	3.6E-15	2.2E-05	6.0E-06	14	20.59	0
CVXQP1_M	1.08751157E+06	1.1E-14	2.4E-05	1.8E-07	12	0.24	0
CVXQP1_S	1.15907184E+04	8.9E-16	1.4E-05	8.5E-06	9	0.01	0
CVXQP2_L	8.18424583E+07	1.8E-15	5.1E-05	6.3E-07	14	7.60	0
CVXQP2_M	8.20155431E+05	1.8E-15	4.8E-05	2.4E-06	11	0.14	0
CVXQP2_S	8.12094049E+03	1.8E-15	3.5E-05	3.0E-07	10	0.01	0
CVXQP3_L	1.15711104E+08	7.6E-07	1.9E-03	4.5E-01	34	574.78	-17
CVXQP3_M	1.36282874E+06	8.9E-16	1.3E-05	1.5E-07	14	0.44	0
CVXQP3_S	1.19434322E+04	8.3E-13	1.3E-05	1.2E-06	9	0.01	0
DEGDIAG	1.66665838E+04	0.0E+00	4.4E-16	9.4E-07	8	1.24	0
DEGENQP	1.94943266E-08	0.0E+00	6.8E-08	7.8E-09	9	7.68	0
DEGTRID	-9.99995000E+04	0.0E+00	1.8E-06	7.1E-09	9	2.99	0
DEGTRID2	-9.99994772E+04	0.0E+00	7.2E-12	2.8E-06	4	1.03	0
DEGTRIDL	4.99999808E-01	1.7E-07	2.6E-06	1.7E-07	7	1.85	0
DPKLO1	3.70096218E-01	7.1E-15	3.6E-05	3.0E-16	1	0.00	0
DTOC3	2.35216400E+02	2.4E-15	1.6E-04	6.2E-14	1	0.02	0
DUAL1	3.50166686E-02	4.4E-16	1.1E-06	2.9E-06	12	0.01	0
DUAL2	3.37351177E-02	2.2E-16	4.6E-07	9.0E-07	10	0.01	0
DUAL3	1.35760991E-01	4.4E-16	1.1E-06	4.5E-06	9	0.02	0
DUAL4	7.46097663E-01	2.2E-16	7.3E-07	2.6E-06	11	0.02	0
DUALC1	6.15525169E+03	0.0E+00	5.0E-06	2.3E-07	25	0.03	0
DUALC2	3.55130639E+03	0.0E+00	4.6E-06	2.2E-06	18	0.02	0

Table A.4: Complete results for option P2 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
DUALC5	4.27232568E+02	1.1E-16	4.4E-06	1.2E-07	15	0.03	0
DUALC8	1.83093612E+04	0.0E+00	6.2E-06	2.8E-06	22	0.06	0
EXDATA	-1.41843155E+02	3.0E-14	1.0E-04	3.0E-06	17	6.87	0
GENHS28	9.27173694E-01	5.6E-16	3.1E-06	1.2E-16	1	0.00	0
GOULDQP2	1.59762769E-12	4.4E-16	1.9E-02	7.5E-07	2	0.25	0
GOULDQP3	6.36961049E-05	4.4E-16	2.3E-02	4.7E-07	3	0.42	0
HS21	-9.99599998E+01	0.0E+00	2.0E-05	2.9E-07	10	0.00	0
HS35	1.11118240E-01	0.0E+00	1.3E-05	7.3E-06	8	0.00	0
HS35MOD	2.50000013E-01	0.0E+00	1.5E-05	2.5E-06	8	0.00	0
HS51	8.50000000E+00	0.0E+00	4.0E+00	0.0E+00	0	0.00	0
HS52	5.32664756E+00	4.4E-16	5.2E-06	1.5E-15	1	0.00	0
HS53	4.09302326E+00	0.0E+00	7.6E-06	1.3E-05	5	0.00	0
HS76	-4.68181302E+00	0.0E+00	2.1E-05	6.7E-06	12	0.00	0
HS118	6.64820464E+02	0.0E+00	7.7E-04	1.0E-06	28	0.01	0
HS268	2.54640327E-07	0.0E+00	4.0E-05	7.0E-07	12	0.00	0
HUES-MOD	3.48244898E+07	7.5E-12	9.5E-02	1.9E-06	14	0.17	0
HUESTIS	3.48298240E+09	6.8E-13	9.5E-02	5.8E-06	11	0.01	0
KSIP	5.75915128E-01	0.0E+00	4.0E-06	1.0E-05	20	0.18	0
LASER	2.40960136E+06	0.0E+00	3.5E-03	3.4E-08	12	0.09	0
LEUVEN1	-1.52429007E+07	2.0E-11	1.8E-02	4.4E-06	61	1.26	0
LEUVEN2	-1.41465394E+07	4.4E-12	1.8E-02	4.8E-06	82	1.61	0
LEUVEN7	6.94547118E+02	0.0E+00	4.1E-05	2.2E-06	23	0.36	0
LISWET1	7.22187787E+00	1.0E-06	1.1E-05	6.3E-07	12	0.13	0
LISWET2	5.00162314E+00	0.0E+00	1.0E-05	1.0E-05	14	0.16	0
LISWET3	4.99853568E+00	0.0E+00	1.0E-05	8.8E-06	17	0.19	0
LISWET4	4.99823444E+00	0.0E+00	1.0E-05	9.6E-06	20	0.22	0
LISWET5	4.99852330E+00	0.0E+00	2.7E-05	7.5E-06	23	0.25	0
LISWET6	4.99889016E+00	0.0E+00	1.1E-05	9.5E-06	16	0.18	0
LISWET7	9.98951652E+01	7.3E-09	6.4E-06	4.0E-09	14	0.15	0
LISWET8	1.43130488E+02	1.2E-11	1.1E-05	8.2E-06	17	0.19	0
LISWET9	3.92919947E+02	1.4E-11	9.5E-06	4.7E-06	18	0.20	0
LISWET10	9.89875297E+00	1.5E-11	1.3E-05	4.7E-06	21	0.23	0
LISWET12	3.47518973E+02	9.7E-13	1.2E-05	9.7E-06	17	0.19	0
LOTSCHD	2.39841585E+03	1.8E-14	2.7E-04	2.5E-06	10	0.01	0
MOSARQP1	-3.82140933E+03	0.0E+00	1.5E-05	6.3E-06	13	0.15	0
MOSARQP2	-5.05259194E+03	0.0E+00	1.1E-05	6.0E-06	12	0.14	0
MPC1	-2.32620447E+07	1.8E-12	1.8E-02	1.2E-06	28	1.17	0
MPC2	-1.50331477E+07	8.5E-12	1.6E-02	7.3E-06	25	0.51	0
MPC3	-1.50295469E+07	2.0E-12	1.6E-02	5.3E-06	24	0.49	0
MPC4	-1.50334607E+07	9.0E-12	1.6E-02	6.3E-06	23	0.47	0
MPC5	-1.50334851E+07	7.7E-12	1.6E-02	4.1E-06	24	0.49	0
MPC6	-1.50335373E+07	3.5E-11	1.6E-02	1.3E-05	22	0.45	0
MPC7	-1.50335567E+07	4.6E-11	2.4E-01	1.6E-05	22	0.46	0
MPC8	-1.50335771E+07	1.7E-11	1.0E-01	7.5E-06	23	0.47	0
MPC9	-1.50335693E+07	1.4E-11	6.6E-02	7.8E-06	22	0.45	0
MPC10	-1.50335538E+07	3.8E-11	1.6E-01	8.4E-06	22	0.46	0
MPC11	-1.50301194E+07	3.9E-12	1.8E-01	1.7E-06	24	0.49	0
MPC12	-1.50334620E+07	1.1E-11	1.6E-02	3.8E-06	26	0.53	0
MPC13	-1.50335763E+07	1.9E-11	1.6E-02	7.1E-06	22	0.45	0
MPC14	-1.50335392E+07	1.4E-11	2.6E-01	2.7E-06	22	0.45	0
MPC15	-1.50335863E+07	3.5E-11	8.7E-01	8.2E-06	20	0.41	0
MPC16	-1.50335836E+07	2.8E-12	3.0E-02	4.4E-07	23	0.48	0
POWELL20	5.20895826E+10	1.8E-08	7.5E-02	1.1E-01	76	3.79	0
PRIMAL1	-3.49843664E-02	0.0E+00	3.5E-07	2.8E-06	12	0.04	0
PRIMAL2	-3.37253066E-02	0.0E+00	3.6E-07	1.4E-06	10	0.05	0
PRIMAL3	-1.35745904E-01	0.0E+00	1.5E-06	1.0E-06	12	0.14	0
PRIMAL4	-7.46083095E-01	0.0E+00	8.4E-06	5.5E-06	10	0.07	0
PRIMALC1	-6.12365709E+03	0.0E+00	9.7E-02	6.2E-07	17	0.02	0
PRIMALC2	-3.55019632E+03	0.0E+00	4.7E-02	1.2E-05	18	0.02	0
PRIMALC5	-4.27230409E+02	0.0E+00	4.6E-03	6.0E-05	11	0.01	0
PRIMALC8	-1.73353213E+04	0.0E+00	2.6E-01	2.6E-06	12	0.03	0
Q25FV47	1.37444479E+07	6.5E-11	1.5E-02	1.3E-06	97	2.19	0
QADLITTL	4.80318859E+05	4.5E-13	3.9E-03	3.8E-05	20	0.02	0
QAFIRO	-1.59075547E+00	8.6E-11	2.6E-04	6.8E-05	18	0.01	0
QPBAND	-3.14333333E+00	0.0E+00	2.0E-05	7.1E-09	9	0.00	0
QBANDM	1.63523447E+04	1.5E-09	8.4E-03	3.5E-07	29	0.08	0
QBEACONF	1.64712872E+05	1.3E-11	2.8E-02	1.9E-09	16	0.03	0
QBORE3D	3.12591907E+03	1.1E-08	6.2E-02	2.9E-06	30	0.06	0
QBRANDY	2.83751565E+04	1.0E-09	3.5E-02	3.8E-06	35	0.06	0
QCAPRI	6.67933017E+07	1.6E-08	6.1E-02	5.9E-02	101	0.30	0
QE226	2.12657259E+02	2.4E-11	1.1E-03	7.4E-07	61	0.16	0
QETAMACR	8.67603698E+04	9.1E-08	4.6E-04	1.3E-05	46	0.22	0

Table A.4: Complete results for option P2 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
QFFFFF80	8.78090621E+05	8.4E-08	2.5E+00	4.5E-03	91	0.63	0
QFORPLAN	7.45663162E+09	4.2E-12	8.2E-02	1.8E-06	40	0.11	0
QGFRDXPN	1.00790586E+11	1.4E-10	7.0E-01	9.3E-05	61	0.28	0
QGROW7	-1.65631181E+07	1.0E-10	3.5E+00	8.8E-06	21	0.05	0
QGROW15	-3.82560279E+07	1.2E-10	3.6E+00	3.9E-06	23	0.10	0
QGROW22	-5.58998667E+07	1.7E-10	3.6E+00	1.0E-05	24	0.15	0
QISRAEL	2.53481531E+07	4.9E-06	2.2E-02	2.3E-06	94	0.16	0
QPCBLEND	-7.67226324E-03	2.9E-12	2.1E-07	1.3E-05	24	0.02	0
QPCBOEI1	1.15039142E+07	2.7E-12	4.7E-03	5.6E-06	61	0.23	0
QPCBOEI2	8.17196355E+06	1.6E-13	8.8E-03	7.9E-08	46	0.07	0
QPCSTAIR	6.20439170E+06	5.0E-11	2.5E-03	1.6E-06	28	0.12	0
QPILOTNO	4.73232880E+06	2.9E-06	1.9E-01	6.4E-05	123	1.79	0
QPTEST	4.37187524E+00	0.0E+00	7.6E-06	2.4E-07	9	0.00	0
QRECIPE	-2.66615999E+02	1.1E-11	2.0E-04	8.3E-07	32	0.03	0
QSC205	-5.81338558E-03	8.4E-13	5.7E-06	1.6E-06	22	0.03	0
QSCAGR25	2.01737938E+08	7.3E-12	2.3E-01	1.3E-06	21	0.06	0
QSCAGR7	2.68659505E+07	9.1E-13	3.9E-02	1.2E-06	20	0.02	0
QSCFXM1	1.68829367E+07	3.6E-12	1.6E-01	8.5E-07	94	0.28	0
QSCFXM2	2.77764417E+07	2.2E-12	1.6E-01	8.5E-07	113	0.69	0
QSCFXM3	3.08166697E+07	4.5E-11	1.6E-01	1.4E-05	130	1.19	0
QSCORPIO	1.88050956E+03	5.0E-11	2.7E-05	1.1E-07	26	0.06	0
QSCRS8	9.04573530E+02	4.7E-09	2.1E-03	1.3E-06	47	0.24	0
QSCSD1	8.66763570E+00	3.0E-16	5.3E-06	6.3E-06	12	0.03	0
QSCSD6	5.08082922E+01	6.5E-16	1.2E-05	1.2E-06	17	0.08	0
QSCSD8	9.40763831E+02	5.6E-15	2.2E-04	3.1E-06	20	0.19	0
QSCTAP1	1.41586116E+03	3.1E-12	1.0E-04	1.7E-06	42	0.12	0
QSCTAP2	1.73502701E+03	1.0E-07	1.0E-05	3.4E-06	44	0.48	0
QSCTAP3	1.43875545E+03	1.3E-08	1.0E-05	3.0E-05	43	0.61	0
QSEBA	8.14818490E+07	1.1E-07	7.3E-02	4.1E-03	58	0.28	0
QSHARE1B	7.88369055E+05	1.2E-10	1.4E+00	1.3E-05	54	0.07	0
QSHARE2B	1.17036918E+04	1.8E-12	6.0E-04	4.5E-06	41	0.04	0
QSHELL	1.57263684E+12	1.2E-10	2.8E+00	9.3E-04	55	0.35	0
QSHIP04L	2.42001554E+06	2.8E-08	8.0E-04	1.4E-04	21	0.16	0
QSHIP04S	2.42499367E+06	2.5E-12	8.0E-04	4.5E-08	21	0.11	0
QSHIP08L	2.37604062E+06	2.7E-11	4.0E-04	8.1E-07	23	0.66	0
QSHIP08S	2.38572885E+06	5.4E-11	1.5E-09	7.6E-05	20	0.25	0
QSHIP12L	3.01887658E+06	1.3E-11	9.2E-04	1.2E-06	25	1.12	0
QSHIP12S	3.05696225E+06	2.1E-13	9.2E-04	2.8E-06	23	0.35	0
QSIERRA	2.37504582E+07	4.0E-10	2.1E-02	2.4E-06	50	0.67	0
QSTAIR	7.98545276E+06	1.7E-10	2.5E-03	8.3E-06	35	0.13	0
QSTANDAT	6.41183901E+03	6.8E-10	9.8E-03	1.9E-06	53	0.25	0
S268	2.54640327E-07	0.0E+00	4.0E-05	7.0E-07	12	0.00	0
STADAT1	-2.85240734E+07	4.6E-08	5.3E-02	1.1E-05	52	1.01	0
STADAT2	-3.26235465E+01	0.0E+00	1.4E-04	4.5E-06	23	0.49	0
STADAT3	-3.57663988E+01	0.0E+00	1.4E-04	1.0E-05	71	3.91	0
STCQP1	3.67100485E+05	1.8E-15	2.0E-05	8.3E-07	11	2.99	0
STCQP2	3.71892743E+04	2.2E-16	2.0E-05	7.5E-07	12	3.30	0
TAME	0.00000000E+00	0.0E+00	5.0E-06	3.6E-12	2	0.01	0
UBH1	7.29027563E+01	4.8E-13	1.1E-02	3.9E-07	11	0.34	0
VALUES	-1.39628875E+00	2.9E-16	3.3E-06	3.0E-06	12	0.02	0
YAO	1.97704553E+02	4.2E-13	4.8E-06	5.6E-08	16	0.18	0
ZECEVIC2	-4.12499396E+00	0.0E+00	1.7E-05	1.0E-05	11	0.00	0

Table A.5: Complete results for option P4

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
A0ENDNDL	4.49324603E-02	2.3E-13	1.0E-04	9.2E-06	15	1.88	0
A0ENINDL	2.08629733E-02	5.2E-13	1.0E-04	4.2E-06	12	1.54	0
A0ENSNDL	1.23623697E-02	3.5E-11	1.0E-04	1.7E-05	20	3.14	0
A0ESDNDL	3.26568757E-02	4.8E-13	1.0E-04	6.6E-06	15	1.88	0
A0ESINDL	3.54858802E-04	3.6E-13	1.0E-04	7.1E-08	15	1.91	0
A2ENDNDL	1.04602061E-03	2.8E-14	1.0E-04	2.4E-07	16	2.00	0
A2ENINDL	1.75321988E-02	1.7E-13	1.0E-04	3.8E-06	11	1.42	0
A2ENSNDL	8.87020266E+02	4.6E-08	1.0E-04	3.4E-01	20	2.37	-17
A2ESDNDL	2.04723926E-02	1.9E-13	1.0E-04	4.7E-06	15	1.91	0
A2ESINDL	4.06945633E-04	4.4E-13	1.0E-04	9.8E-08	14	1.77	0
A5ENINDL	4.91573717E-03	2.5E-13	1.0E-04	1.4E-06	11	1.42	0
A5ENSNDL	1.79519502E+03	8.4E-08	1.0E-04	5.6E-01	13	1.58	-17
A5ESDNDL	5.33643877E-04	9.2E-14	1.0E-04	1.6E-07	15	1.86	0
A5ESINDL	3.78603976E-05	2.8E-13	1.0E-04	1.4E-08	13	1.65	0
A5ESSNDL	1.79512521E+03	8.4E-08	1.0E-04	5.6E-01	13	1.58	-17

Table A.5: Complete results for option P4 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
AUG2D	1.68741175E+06	1.1E-14	3.5E-04	1.9E-12	1	0.11	0
AUG2DC	1.81836807E+06	1.1E-14	3.5E-04	1.9E-12	1	0.11	0
AUG2DCQP	6.49813474E+06	2.1E-14	6.5E-04	2.1E-07	27	3.78	0
AUG2DQP	6.23701203E+06	2.1E-14	6.6E-04	1.8E-06	18	2.56	0
AUG3D	2.45614860E+04	2.6E-15	5.8E-05	1.4E-14	1	0.25	0
AUG3DC	2.76540711E+04	2.7E-15	5.6E-05	2.2E-14	1	0.25	0
AUG3DCQP	6.15603855E+04	2.9E-12	8.3E-05	8.5E-06	21	6.23	0
AUG3DQP	5.42290022E+04	4.9E-15	8.5E-05	6.0E-06	21	6.21	0
BOYD1	-6.17352196E+07	9.9E-02	3.4E-04	7.9E-05	37	21.86	0
BOYD2	2.12593069E+01	4.3E-01	5.9E-05	5.7E-04	89	215.08	0
CONT5-QP	1.33857169E-02	9.1E-12	9.9E-06	7.2E-06	12	11.84	0
CONT-050	-4.56348122E+00	2.7E-15	3.5E-05	3.9E-06	8	0.29	0
CONT1-10	-4.63960622E+00	3.3E-15	3.5E-05	6.6E-07	8	1.49	0
CONT-101	2.01497939E-01	5.3E-15	7.6E-05	1.3E-07	6	1.15	0
CONT1-20	-4.32603170E+00	3.3E-15	2.7E-05	1.2E-05	6	6.17	0
CONT-201	2.08387168E-01	5.3E-15	6.9E-05	1.9E-06	12	12.30	0
CONT-300	2.12202975E-01	2.0E-08	6.6E-05	6.6E-08	11	29.14	0
CVXQP1_L	1.08704800E+08	1.8E-15	2.3E-05	1.4E-04	10	14.75	0
CVXQP1_M	1.08751157E+06	1.8E-15	2.4E-05	3.1E-06	10	0.25	0
CVXQP1_S	1.15907181E+04	8.9E-16	1.3E-05	7.2E-07	8	0.02	0
CVXQP2_L	8.18424583E+07	1.7E-13	5.1E-05	2.5E-07	11	6.60	0
CVXQP2_M	8.20155431E+05	1.8E-15	4.8E-05	3.4E-07	8	0.13	0
CVXQP2_S	8.12094059E+03	8.9E-16	3.5E-05	2.1E-06	8	0.01	0
CVXQP3_L	1.15711104E+08	1.0E-08	5.7E-04	6.7E-03	9	54.02	0
CVXQP3_M	1.36282874E+06	1.8E-15	1.4E-05	6.7E-06	12	0.44	0
CVXQP3_S	1.19434325E+04	1.8E-14	1.3E-05	7.3E-05	7	0.02	0
DEGDIAG	1.66666038E+04	0.0E+00	7.5E-16	3.7E-06	6	1.77	0
DEGENQP	5.21586633E-06	0.0E+00	4.4E-11	5.8E-08	9	13.05	0
DEGTRID	-9.99995000E+04	0.0E+00	4.1E-06	1.4E-05	5	2.16	0
DEGTRID2	-9.99994855E+04	0.0E+00	4.6E-16	3.1E-07	4	1.73	0
DEGTRIDL	5.00000043E-01	5.0E-08	4.4E-16	1.1E-07	5	2.27	0
DPKLO1	3.70096218E-01	7.1E-15	3.6E-05	3.0E-16	1	0.00	0
DTOC3	2.35216400E+02	2.4E-15	1.6E-04	6.2E-14	1	0.02	0
DUAL1	3.50249857E-02	3.3E-16	3.5E-06	5.2E-06	12	0.03	0
DUAL2	3.37341282E-02	2.2E-16	5.2E-07	8.7E-07	12	0.03	0
DUAL3	1.35761629E-01	3.3E-16	6.6E-07	1.3E-06	11	0.04	0
DUAL4	7.46102235E-01	4.4E-16	2.8E-06	3.3E-06	10	0.02	0
DUALC1	6.15525170E+03	1.2E-14	2.0E-02	8.6E-06	21	0.05	0
DUALC2	3.55130639E+03	0.0E+00	4.7E-06	2.3E-06	15	0.03	0
DUALC5	4.27232584E+02	0.0E+00	1.4E-05	5.4E-06	15	0.04	0
DUALC8	1.83093612E+04	0.0E+00	3.4E-05	6.4E-08	21	0.09	0
EXDATA	-1.41843154E+02	6.5E-15	1.0E-04	1.2E-06	14	6.49	0
GENHS28	9.27173694E-01	5.6E-16	3.1E-06	1.2E-16	1	0.00	0
GOULDQP2	1.59762769E-12	4.4E-16	1.9E-02	7.5E-07	2	0.41	0
GOULDQP3	6.36529730E-05	4.4E-16	2.3E-02	4.7E-07	3	0.69	0
HS21	-9.99599982E+01	0.0E+00	2.0E-05	1.9E-06	9	0.00	0
HS35	1.11112558E-01	0.0E+00	1.3E-05	1.4E-06	7	0.00	0
HS35MOD	2.50000480E-01	0.0E+00	1.5E-05	7.4E-06	8	0.00	0
HS51	8.50000000E+00	0.0E+00	4.0E+00	0.0E+00	0	0.00	0
HS52	5.32664756E+00	4.4E-16	5.2E-06	1.5E-15	1	0.00	0
HS53	4.09302326E+00	0.0E+00	7.1E-06	5.7E-06	5	0.00	0
HS76	-4.68181053E+00	0.0E+00	2.1E-05	3.8E-06	12	0.00	0
HS118	6.64820480E+02	0.0E+00	7.7E-04	2.0E-06	16	0.01	0
HS268	2.89364834E-08	0.0E+00	4.0E-05	4.3E-07	8	0.00	0
HUES-MOD	3.48244898E+07	3.0E-12	9.5E-02	3.3E-06	10	0.24	0
HUESTIS	3.48298240E+09	9.1E-13	9.5E-02	7.8E-06	8	0.01	0
KSIP	5.75934313E-01	0.0E+00	4.0E-06	6.2E-06	13	0.17	0
LASER	2.40960136E+06	0.0E+00	3.5E-03	2.6E-07	9	0.12	0
LEUVEN1	-1.52429007E+07	2.0E-12	1.8E-02	1.1E-06	44	1.29	0
LEUVEN2	-1.41465394E+07	1.4E-11	1.8E-02	8.4E-06	68	1.96	0
LEUVEN7	6.94551749E+02	0.0E+00	4.1E-05	4.3E-05	17	0.36	0
LISWET1	7.22268107E+00	0.0E+00	1.1E-05	4.3E-06	9	0.18	0
LISWET2	4.99923505E+00	0.0E+00	1.0E-05	2.4E-06	12	0.23	0
LISWET3	4.99805096E+00	0.0E+00	1.0E-05	6.6E-06	18	0.35	0
LISWET4	5.00181799E+00	0.0E+00	1.0E-05	1.3E-04	12	0.23	0
LISWET5	4.99831751E+00	0.0E+00	2.7E-05	4.2E-06	13	0.25	0
LISWET6	4.99817008E+00	0.0E+00	1.1E-05	9.3E-06	15	0.29	0
LISWET7	9.98958409E+01	0.0E+00	6.4E-06	3.4E-07	10	0.20	0
LISWET8	1.43130084E+02	3.4E-11	1.1E-05	6.7E-06	13	0.26	0
LISWET9	3.92920022E+02	2.1E-11	9.5E-06	4.7E-06	19	0.36	0
LISWET10	9.89696558E+00	0.0E+00	1.3E-05	6.2E-06	13	0.26	0
LISWET12	3.47517773E+02	7.5E-11	1.2E-05	9.4E-06	16	0.31	0

Table A.5: Complete results for option P4 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
LOTSCHD	2.39841584E+03	2.8E-14	2.7E-04	1.1E-08	8	0.01	0
MOSARQP1	-3.82140955E+03	0.0E+00	1.5E-05	5.5E-07	12	0.24	0
MOSARQP2	-5.05259194E+03	0.0E+00	1.1E-05	6.0E-06	11	0.22	0
MPC1	-2.32620447E+07	3.0E-12	1.8E-02	5.4E-06	21	1.10	0
MPC2	-1.50331477E+07	8.2E-12	1.6E-02	6.5E-06	19	0.57	0
MPC3	-1.50295469E+07	7.6E-12	1.6E-02	7.3E-06	19	0.57	0
MPC4	-1.50334607E+07	3.5E-12	1.6E-02	9.2E-07	19	0.58	0
MPC5	-1.50334851E+07	1.2E-12	1.6E-02	4.0E-07	19	0.57	0
MPC6	-1.50335373E+07	5.5E-12	8.0E-02	4.7E-06	18	0.54	0
MPC7	-1.50335567E+07	4.4E-12	8.6E-02	5.4E-06	18	0.54	0
MPC8	-1.50335771E+07	5.6E-12	7.3E-02	3.0E-06	18	0.55	0
MPC9	-1.50335693E+07	2.2E-12	2.0E-02	1.9E-06	18	0.54	0
MPC10	-1.50335538E+07	4.3E-12	4.5E-02	2.1E-06	18	0.54	0
MPC11	-1.50301194E+07	1.0E-12	1.6E-02	5.4E-07	21	0.63	0
MPC12	-1.50334620E+07	2.0E-11	3.7E-01	3.3E-05	18	0.54	0
MPC13	-1.50335763E+07	1.2E-11	5.6E-01	1.2E-05	18	0.55	0
MPC14	-1.50335392E+07	3.2E-07	2.6E-02	2.2E-06	23	0.76	0
MPC15	-1.50335863E+07	4.4E-12	3.0E-01	6.1E-06	17	0.51	0
MPC16	-1.50335836E+07	4.7E-12	3.1E-01	4.4E-06	17	0.51	0
POWELL20	5.20895828E+10	3.1E-09	7.5E-02	2.0E-02	54	4.94	0
PRIMAL1	-3.49155384E-02	0.0E+00	3.4E-07	9.6E-06	13	0.06	0
PRIMAL2	-3.36906375E-02	0.0E+00	3.6E-07	9.3E-06	9	0.06	0
PRIMAL3	-1.35574328E-01	0.0E+00	1.5E-06	4.0E-06	10	0.15	0
PRIMAL4	-7.45982226E-01	0.0E+00	8.4E-06	7.0E-06	7	0.07	0
PRIMALC1	-6.12365721E+03	0.0E+00	9.7E-02	1.4E-07	15	0.03	0
PRIMALC2	-3.55019786E+03	0.0E+00	4.7E-02	3.5E-06	14	0.02	0
PRIMALC5	-4.27231711E+02	0.0E+00	4.6E-03	1.8E-06	9	0.02	0
PRIMALC8	-1.73353222E+04	0.0E+00	2.6E-01	1.8E-07	11	0.04	0
Q25FV47	1.37444479E+07	9.7E-11	1.5E-02	2.2E-06	80	2.40	0
QADLITTL	4.80318859E+05	2.3E-13	3.9E-03	1.1E-06	16	0.02	0
QAFIRO	-1.59076897E+00	7.1E-15	2.6E-04	9.8E-07	14	0.01	0
QPBAND	-3.14333120E+00	0.0E+00	1.9E-05	1.1E-06	7	0.00	0
QBANDM	1.63523447E+04	6.3E-12	8.4E-03	5.0E-07	23	0.10	0
QBEACONF	1.64712873E+05	2.1E-09	2.8E-02	2.6E-05	12	0.04	0
QBORE3D	3.12591908E+03	1.7E-09	6.2E-02	1.2E-06	31	0.09	0
QBRANDY	2.83751565E+04	1.5E-10	3.5E-02	7.7E-08	29	0.08	0
QCAPRI	6.67933017E+07	2.7E-06	6.1E-02	4.0E+00	102	0.45	0
QE226	2.12657276E+02	1.5E-10	1.1E-03	4.5E-06	42	0.18	0
QETAMACR	8.67603698E+04	8.0E-08	4.6E-04	1.2E-05	30	0.23	0
QFFFFF80	8.78090621E+05	2.6E-10	2.5E+00	4.5E-09	78	0.80	0
QFORPLAN	7.45663162E+09	9.3E-10	8.2E-02	4.1E-06	32	0.16	0
QGFRDXPN	1.00790586E+11	6.1E-08	7.0E-01	4.9E-06	61	0.51	0
QGROW7	-1.65631181E+07	1.5E-06	3.5E+00	1.7E-06	16	0.06	0
QGROW15	-3.82560279E+07	1.5E-07	3.6E+00	2.1E-07	19	0.14	0
QGROW22	-5.58998667E+07	1.5E-10	3.6E+00	8.4E-07	20	0.21	0
QISRAEL	2.53481531E+07	0.0E+00	2.2E-02	5.2E-06	68	0.19	0
QPCBLEND	-7.72930911E-03	9.8E-13	2.1E-07	1.3E-05	14	0.02	0
QPCBOEI1	1.15039142E+07	4.4E-12	4.7E-03	5.2E-08	53	0.34	0
QPCBOEI2	8.17196355E+06	5.9E-13	8.8E-03	4.7E-07	41	0.11	0
QPCSTAIR	6.20439170E+06	4.9E-11	2.5E-03	3.4E-06	21	0.13	0
QPILOTNO	4.73232880E+06	2.7E-06	1.9E-01	6.0E-05	107	2.38	0
QPTEST	4.37188087E+00	0.0E+00	8.1E-06	9.7E-06	8	0.00	0
QRECIPE	-2.66615998E+02	5.0E-15	2.0E-04	7.1E-07	27	0.05	0
QSC205	-5.80922678E-03	1.6E-12	9.8E-06	2.7E-06	18	0.05	0
QSCAGR25	2.01737938E+08	3.6E-12	2.3E-01	1.9E-06	18	0.09	0
QSCAGR7	2.68659505E+07	1.3E-12	3.9E-02	5.0E-08	17	0.03	0
QSCFXM1	1.68829367E+07	4.5E-13	1.6E-01	4.7E-08	79	0.39	0
QSCFXM2	2.77764417E+07	1.3E-11	1.6E-01	5.5E-06	95	0.95	0
QSCFXM3	3.08166697E+07	2.5E-08	1.6E-01	1.5E-05	105	1.56	0
QSCORPIO	1.88050956E+03	2.6E-13	2.7E-05	2.8E-08	18	0.07	0
QSCRS8	9.04573869E+02	3.4E-08	2.1E-03	4.1E-06	30	0.27	0
QSCSD1	8.66672101E+00	2.2E-16	5.4E-06	1.5E-06	11	0.05	0
QSCSD6	5.08096223E+01	7.5E-16	1.0E-05	9.2E-06	12	0.10	0
QSCSD8	9.40766150E+02	8.9E-15	2.2E-04	1.1E-05	11	0.19	0
QSCTAP1	1.41586124E+03	6.1E-12	1.0E-04	3.3E-06	31	0.15	0
QSCTAP2	1.73502678E+03	5.9E-13	1.0E-05	1.4E-06	35	0.64	0
QSCTAP3	1.43875523E+03	1.1E-12	1.0E-05	3.4E-06	34	0.83	0
QSEBA	8.14818490E+07	1.4E-10	7.3E-02	4.9E-06	61	0.53	0
QSHARE1B	7.88369055E+05	1.9E-10	1.4E+00	3.0E-06	49	0.10	0
QSHARE2B	1.17036918E+04	1.2E-12	6.0E-04	1.3E-05	32	0.05	0
QSHELL	1.57263684E+12	7.0E-11	2.8E+00	7.4E-05	46	0.52	0
QSHIP04L	2.42001554E+06	1.2E-10	8.0E-04	1.8E-05	21	0.28	0

Table A.5: Complete results for option P4 (continued)

name	f	$\|r^{\mathrm{P}}\|$	$\|r^{\mathrm{D}}\|$	$\|r^{\mathrm{CS}}\|$	iter	time	status
QSHIP04S	2.42499367E+06	3.8E-11	8.0E-04	1.4E-06	21	0.20	0
QSHIP08L	2.37604062E+06	3.0E-11	4.0E-04	5.9E-06	21	0.86	0
QSHIP08S	2.38572885E+06	1.5E-12	4.0E-04	3.2E-07	20	0.39	0
QSHIP12L	3.01887658E+06	9.2E-12	9.2E-04	4.5E-06	20	1.24	0
QSHIP12S	3.05696225E+06	1.2E-10	9.2E-04	8.1E-06	22	0.52	0
QSIERRA	2.37504582E+07	1.3E-10	2.1E-02	1.6E-06	32	0.77	0
QSTAIR	7.98545276E+06	7.6E-10	2.5E-03	7.9E-06	26	0.15	0
QSTANDAT	6.41184788E+03	5.3E-09	9.8E-03	2.7E-05	46	0.40	0
S268	2.89364834E-08	0.0E+00	4.0E-05	4.3E-07	8	0.00	0
STADAT1	-2.85240734E+07	2.8E-09	5.3E-02	1.9E-05	41	1.53	0
STADAT2	-3.26236803E+01	0.0E+00	1.4E-04	4.8E-06	17	0.61	0
STADAT3	-3.57661290E+01	0.0E+00	1.4E-04	3.6E-06	49	5.47	0
STCQP1	3.67100485E+05	3.6E-15	2.0E-05	2.6E-05	8	2.66	0
STCQP2	3.71892743E+04	0.0E+00	2.0E-05	4.1E-07	9	2.98	0
TAME	0.00000000E+00	0.0E+00	5.0E-06	3.6E-12	2	0.01	0
UBH1	7.29026261E+01	1.8E-13	1.1E-02	3.9E-07	6	0.33	0
VALUES	-1.39617379E+00	3.3E-16	3.3E-06	5.5E-06	10	0.02	0
YAO	1.97708823E+02	4.3E-07	4.8E-06	8.6E-06	11	0.22	0
ZECEVIC2	-4.12499993E+00	0.0E+00	1.8E-05	7.4E-08	10	0.00	0

Appendix B

To decode and run all of the CUTEr QP test problems, we recommend the settings

```
C  maximum number of variables
      PARAMETER      ( NMAX   = 1000000 )
C  maximum number of groups
      PARAMETER      ( NGMAX  = 600000 )
C  maximum number of different group types
      PARAMETER      ( NGRMAX = 10    )
C  maximum total number of real parameters associated with groups
      PARAMETER      ( NGPVMX = 1200000 )
C  maximum number of nonlinear elements
      PARAMETER      ( NELMAX = 1000000 )
C  maximum number of different nonlinear element types
      PARAMETER      ( NLMAX  = 20     )
C  maximum total number of elemental variables
      PARAMETER      ( NEVMAX = 1000000 )
C  maximum total number of internal variables
      PARAMETER      ( NINMAX = 150000  )
C  maximum number of entries in an element Hessian
      PARAMETER      ( NSETVC = 100    )
C  maximum number of real parameters associated with nonlinear elements
      PARAMETER      ( NEPVMX = 1000000 )
C  maximum number of nonzeros in linear elements
      PARAMETER      ( LA     = 8000000 )
C  maximum number of integer parameters
      PARAMETER      ( NINDEX = 100    )
C  maximum number of real parameters
      PARAMETER      ( NRLNDX = 20000  )
C  maximum number of vectors of bounds
      PARAMETER      ( NBMAX  = 2      )
C  maximum number of vectors of solutions
      PARAMETER      ( NSMAX  = 3      )
C  maximum number of vectors of bounds on the objective function
      PARAMETER      ( NOBMAX = 2      )
```

for the parameters in `./double/config/sifdec.siz` in the user-installed SifDec directory, and

```
C  integer workspace
      PARAMETER       ( LIWK   =  40000000 )
C  real/double precision workspace
      PARAMETER       ( LWK    =  45000000  )
```

```
C  logical workspace
      PARAMETER       ( LLOGIC =  3000000  )
C  character workspace
      PARAMETER       ( LCHARA =  2500000  )
C  workspace to store the problem's function and derivatives values
      PARAMETER       ( LFUVAL =  9000000  )
```

for those in `./double/config/tools.siz` in the user-installed CUTEr directory.

Appendix C

The results in Tables A.2–A.5 were obtained by setting the following non-default values in the `CQP` data specification file (see `CQP` documentation for details):

```
BEGIN CQP SPECIFICATIONS
  series-order                                4
  puiseux-series                              no
  maximum-poor-iterations-before-infeasible   20
  absolute-primal-accuracy                    1.0D-5
  relative-primal-accuracy                    1.0D-5
  absolute-dual-accuracy                      1.0D-5
  relative-dual-accuracy                      1.0D-5
  absolute-complementary-slackness-accuracy   1.0D-5
  relative-complementary-slackness-accuracy   1.0D-5
END CQP SPECIFICATIONS

BEGIN FDC SPECIFICATIONS
  symmetric-linear-equation-solver            ma97
  unsymmetric-linear-equation-solver          ma48
END FDC SPECIFICATIONS

BEGIN ROOTS SPECIFICATIONS
  root-tolerance                              2.2D-16
END ROOTS SPECIFICATIONS

BEGIN SBLS SPECIFICATIONS
  maximum-refinements                         2
  preconditioner-used                         2
  factorization-used                          0
  symmetric-linear-equation-solver            ma97
  definite-linear-equation-solver             ma97
  unsymmetric-linear-equation-solver          ma48
END SBLS SPECIFICATIONS

BEGIN SLS SPECIFICATIONS
  relative-pivot-tolerance                    1.0D-12
  minimum-pivot-tolerance                     1.0D-12
  absolute-pivot-tolerance                    2.0D-30
END SLS SPECIFICATIONS
```

A quadratic residual trajectory is obtained by switching `puiseux-series` to `yes`, while second and fourth order series require that `series-order` is changed to `2` and `4` respectively.

For the degenerate tests reported in Table 6.1 in the main paper, the values of the relative and absolute accuracy parameters (`absolute-primal-accuracy`, etc) are reduced to `1.0D-12`

References

1. N. I. M. Gould, D. Orban, and Ph. L. Toint. CUTEr (and SifDec), a Constrained and Unconstrained Testing Environment, revisited. *Transactions of the ACM on Mathematical Software*, 29(4):373–394, 2003.
2. I. Maros and C. Meszaros. A repository of convex quadratic programming problems. *Optimization Methods and Software*, 11-12:671–681, 1999.