Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
biggsc4-1	0.0001	1	26	16	1.08E-05	1.65E-03
biggsc4-2	0.0001	1	26	16	1.20E-05	1.74E-03
biggsc4-3	0.0001	1	27	17	5.19E-06	1.15E-03
biggsc4-4	0.0001	1	27	16	7.42E-06	1.37E-03
biggsc4-5	0.0001	1	30	20	2.33E-05	2.43E-03
biggsc4-ave	0.0001	1.0	27.2	17.0	1.17E-05	1.67E-03
biggsc4-1	0.001	1	24	13	1.08E-04	5.22E-03
biggsc4-2	0.001	1	22	13	1.20E-04	5.51E-03
biggsc4-3	0.001	1	24	14	5.18E-05	3.62E-03
biggsc4-4	0.001	1	24	14	7.40E-05	4.33E-03
biggsc4-5	0.001	1	29	20	2.33E-04	7.69E-03
biggsc4-ave	0.001	1.0	24.6	14.8	1.17E-04	5.27E-03
biggsc4-1	0.01	1	23	11	1.08E-03	1.66E-02
biggsc4-2	0.01	1	24	11	1.20E-03	1.75E-02
biggsc4-3	0.01	1	22	12	5.18E-04	1.15E-02
biggsc4-4	0.01	1	20	11	7.40E-04	1.37E-02
biggsc4-5	0.01	1	29	20	2.33E-03	2.46E-02
biggsc4-ave	0.01	1.0	23.6	13.0	1.17E-03	1.68E-02
hatfldh-1	0.0001	1	21	16	1.08E-05	1.65E-03
hatfldh-2	0.0001	1	21	16	1.20E-05	1.74E-03
hatfldh-3	0.0001	1	22	17	5.19E-06	1.15E-03
hatfldh-4	0.0001	1	22	16	7.41E-06	1.37E-03
hatfldh-5	0.0001	1	25	20	2.33E-05	2.43E-03
hatfldh-ave	0.0001	1.0	22.2	17.0	1.17E-05	1.67E-03
hatfldh-1	0.001	1	19	13	1.08E-04	5.22E-03
hatfldh-2	0.001	1	19	13	1.20E-04	5.51E-03
hatfldh-3	0.001	1	19	14	5.18E-05	3.62E-03
hatfldh-4	0.001	1	19	14	7.39E-05	4.33E-03
hatfldh-5	0.001	1	25	20	2.33E-04	7.69E-03
hatfldh-ave	0.001	1.0	20.2	14.8	1.17E-04	5.27E-03
hatfldh-1	0.01	1	16	11	1.08E-03	1.66E-02
hatfldh-2	0.01	1	16	11	1.20E-03	1.75E-02
hatfldh-3	0.01	1	17	12	5.18E-04	1.15E-02
hatfldh-4	0.01	1	17	11	7.40E-04	1.37E-02
hatfldh-5	0.01	1	25	20	2.33E-03	2.46E-02
hatfldh-ave	0.01	1.0	18.2	13.0	1.17E-03	1.68E-02
hs035-1	0.0001	1	9	5	8.69E-06	3.89E-03
hs035-2	0.0001	1	9	4	3.51E-05	7.82E-03
hs035-3	0.0001	1	9	5	1.76E-05	5.54E-03
hs035-4	0.0001	1	9	5	1.10E-05	4.39E-03
hs035-5	0.0001	1	9	5	2.58E-05	6.71E-03
hs035-ave	0.0001	1.0	9.0	4.8	1.96E-05	5.67E-03
hs035-1	0.001	1	9	5	8.68E-05	1.23E-02
hs035-2	0.001	1	9	5	3.51E-04	2.47E-02
hs035-3	0.001	1	9	5	1.76E-04	1.75E-02
hs035-4	0.001	1	9	5	1.10E-04	1.39E-02
hs035-5	0.001	1	9	5	2.58E-04	2.12E-02
hs035-ave	0.001	1.0	9.0	5.0	1.96E-04	1.79E-02
hs035-1	0.01	1	9	5	8.68E-04	3.89E-02
hs035-2	0.01	1	9	7	3.51E-03	7.83E-02
hs035-3	0.01	1	9	5	1.76E-03	5.54E-02
hs035-4	0.01	1	9	5	1.10E-03	4.39E-02
hs035-5	0.01	1	9	5	2.58E-03	6.71E-02
hs035-ave	0.01	1.0	9.0	5.4	1.96E-03	5.67E-02

TABLE 1. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.

Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
hs044-1	0.0001	1	15	3	5.50E-06	1.94E-03
hs044-2	0.0001	1	15	3	1.11E-05	2.77E-03
hs044-3	0.0001	1	15	3	9.64E-06	2.58E-03
hs044-4	0.0001	1	15	4	4.78E-05	5.73E-03
hs044-5	0.0001	2	15	3	1.25E-05	2.94E-03
hs044-ave	0.0001	1.2	15.0	3.2	1.73E-05	3.19E-03
hs044-1	0.001	1	15	3	5.51E-05	6.16E-03
hs044-2	0.001	1	15	3	1.11E-04	8.76E-03
hs044-3	0.001	1	15	4	9.62E-05	8.14E-03
hs044-4	0.001	1	15	5	4.78E-04	1.81E-02
hs044-5	0.001	2	15	3	1.25E-04	9.29E-03
hs044-ave	0.001	1.2	15.0	3.6	1.73E-04	1.01E-02
hs044-1	0.01	1	15	3	5.51E-04	1.95E-02
hs044-2	0.01	1	15	4	1.11E-03	2.77E-02
hs044-3	0.01	1	15	5	9.62E-04	2.58E-02
hs044-4	0.01	1	14	6	4.78E-03	5.74E-02
hs044-5	0.01	2	15	4	1.25E-03	2.94E-02
hs044-ave	0.01	1.2	14.8	4.4	1.73E-03	3.19E-02
hs076-1	0.0001	1	10	4	9.16E-06	3.71E-03
hs076-2	0.0001	1	10	4	2.14E-05	5.67E-03
hs076-3	0.0001	1	10	4	4.38E-05	8.11E-03
hs076-4	0.0001	1	10	4	7.03E-06	3.25E-03
hs076-5	0.0001	1	10	4	5.33E-05	8.95E-03
hs076-ave	0.0001	1.0	10.0	4.0	2.69E-05	5.94E-03
hs076-1	0.001	1	10	4	9.18E-05	1.17E-02
hs076-2	0.001	1	10	4	2.14E-04	1.79E-02
hs076-3	0.001	1	10	4	4.38E-04	2.57E-02
hs076-4	0.001	1	10	4	7.05E-05	1.03E-02
hs076-5	0.001	1	10	4	5.33E-04	2.83E-02
hs076-ave	0.001	1.0	10.0	4.0	2.70E-04	1.88E-02
hs076-1	0.01	1	10	4	9.18E-04	3.71E-02
hs076-2	0.01	1	10	4	2.14E-03	5.68E-02
hs076-3	0.01	1	10	4	4.38E-03	8.12E-02
hs076-4	0.01	1	10	4	7.05E-04	3.25E-02
hs076-5	0.01	1	10	4	5.33E-03	8.96E-02
hs076-ave	0.01	1.0	10.0	4.0	2.70E-03	5.95E-02
hs118-1	0.0001	1	15	3	4.23E-06	3.90E-03
hs118-2	0.0001	3	15	3	1.49E-05	7.32E-03
hs118-3	0.0001	3	15	3	3.87E-05	1.18E-02
hs118-4	0.0001	1	15	3	5.15E-05	1.36E-02
hs118-5	0.0001	2	15	3	6.08E-06	4.67E-03
hs118-ave	0.0001	2.0	15.0	3.0	2.31E-05	8.25E-03
hs118-1	0.001	1	15	3	4.23E-05	1.23E-02
hs118-2	0.001	3	15	3	1.49E-04	2.32E-02
hs118-3	0.001	3	15	4	3.87E-04	3.73E-02
hs118-4	0.001	1	15	4	5.15E-04	4.30E-02
hs118-5	0.001	2	15	3	6.08E-05	1.48E-02
hs118-ave	0.001	2.0	15.0	3.4	2.31E-04	2.61E-02
hs118-1	0.01	1	15	4	4.23E-04	3.90E-02
hs118-2	0.01	3	15	5	1.49E-03	7.32E-02
hs118-3	0.01	3	15	7	3.87E-03	1.18E-01
hs118-4	0.01	1	15	7	5.15E-03	1.36E-01
hs118-5	0.01	2	15	4	6.08E-04	4.67E-02
hs118-ave	0.01	2.0	15.0	5.4	2.31E-03	8.25E-02

TABLE 2. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.

Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
hs44new-1	0.0001	1	19	4	4.45E-05	5.53E-03
hs44new-2	0.0001	1	19	3	7.13E-06	2.21E-03
hs44new-3	0.0001	1	19	3	3.48E-05	4.90E-03
hs44new-4	0.0001	1	19	3	4.16E-06	1.69E-03
hs44new-5	0.0001	1	19	4	4.41E-05	5.51E-03
hs44new-ave	0.0001	1.0	19.0	3.4	2.69E-05	3.97E-03
hs44new-1	0.001	1	19	5	4.45E-04	1.75E-02
hs44new-2	0.001	1	19	3	7.14E-05	7.01E-03
hs44new-3	0.001	1	19	3	3.48E-04	1.55E-02
hs44new-4	0.001	1	19	3	4.16E-05	5.35E-03
hs44new-5	0.001	1	19	5	4.41E-04	1.74E-02
hs44new-ave	0.001	1.0	19.0	3.8	2.70E-04	1.26E-02
hs44new-1	0.01	1	17	6	4.45E-03	5.54E-02
hs44new-2	0.01	1	19	4	7.14E-04	2.22E-02
hs44new-3	0.01	1	17	4	3.48E-03	4.90E-02
hs44new-4	0.01	1	19	3	4.17E-04	1.69E-02
hs44new-5	0.01	1	19	6	4.41E-03	5.53E-02
hs44new-ave	0.01	1.0	18.2	4.6	2.70E-03	3.98E-02
ksip-1	0.0001	27	55	44	1.10E-03	9.27E-02
ksip-2	0.0001	21	46	42	1.83E-03	1.21E-01
ksip-3	0.0001	21	40	34	2.53E-03	6.89E-01
ksip-4	0.0001	24	41	48	3.44E-03	5.89E-01
ksip-5	0.0001	29	45	41	1.71E-03	5.59E-01
ksip-ave	0.0001	24.4	45.4	41.8	2.12E-03	4.10E-01
ksip-1	0.001	27	52	39	6.66E-03	6.59E-01
ksip-2	0.001	21	52	42	3.35E-03	1.17E-01
ksip-3	0.001	21	40	37	3.16E-03	7.00E-01
ksip-4	0.001	24	44	46	1.25E-02	7.25E-01
ksip-5	0.001	29	45	50	5.81E-03	7.08E-01
ksip-ave	0.001	24.4	46.6	42.8	6.30E-03	5.82E-01
ksip-1	0.01	27	51	37	1.54E-02	5.90E-01
ksip-2	0.01	21	38	169	1.55E-02	6.09E-01
ksip-3	0.01	21	39	43	5.36E-03	7.08E-01
ksip-4	0.01	24	42	37	1.11E-02	7.30E-01
ksip-5	0.01	29	43	37	2.26E-02	6.36E-01
ksip-ave	0.01	24.4	42.6	64.6	1.40E-02	6.55E-01
lsqfit-1	0.0001	1	8	4	8.94E-06	3.12E-03
lsqfit-2	0.0001	1	8	4	3.61E-05	6.26E-03
lsqfit-3	0.0001	1	8	4	1.81E-05	4.43E-03
lsqfit-4	0.0001	1	8	4	1.14E-05	3.51E-03
lsqfit-5	0.0001	1	8	4	2.65E-05	5.37E-03
lsqfit-ave	0.0001	1.0	8.0	4.0	2.02E-05	4.54E-03
lsqfit-1	0.001	1	8	4	8.93E-05	9.85E-03
lsqfit-2	0.001	1	8	5	3.61E-04	1.98E-02
lsqfit-3	0.001	1	8	4	1.81E-04	1.40E-02
lsqfit-4	0.001	1	8	4	1.14E-04	1.11E-02
lsqfit-5	0.001	1	8	4	2.65E-04	1.70E-02
lsqfit-ave	0.001	1.0	8.0	4.2	2.02E-04	1.43E-02
lsqfit-1	0.01	1	8	4	8.93E-04	3.12E-02
lsqfit-2	0.01	1	8	7	3.61E-03	6.27E-02
lsqfit-3	0.01	1	8	4	1.81E-03	4.43E-02
lsqfit-4	0.01	1	8	4	1.14E-03	3.51E-02
lsqfit-5	0.01	1	8	4	2.65E-03	5.37E-02
lsqfit-ave	0.01	1.0	8.0	4.6	2.02E-03	4.54E-02

TABLE 3. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.

Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
mosarqp1-1	0.0001	14	13	5	2.52E-04	9.91E-03
mosarqp1-2	0.0001	29	13	5	2.52E-04	9.91E-03
mosarqp1-3	0.0001	20	13	5	2.52E-04	9.91E-03
mosarqp1-4	0.0001	28	13	5	2.52E-04	9.91E-03
mosarqp1-5	0.0001	13	13	5	2.52E-04	9.90E-03
mosarqp1-ave	0.0001	20.8	13.0	5.0	2.52E-04	9.91E-03
mosarqp1-1	0.001	14	13	5	2.53E-04	9.95E-03
mosarqp1-2	0.001	29	13	5	2.54E-04	9.96E-03
mosarqp1-3	0.001	20	13	5	2.55E-04	9.97E-03
mosarqp1-4	0.001	28	13	5	2.55E-04	9.96E-03
mosarqp1-5	0.001	13	13	5	2.50E-04	9.89E-03
mosarqp1-ave	0.001	20.8	13.0	5.0	2.53E-04	9.95E-03
mosarqp1-1	0.01	14	13	5	3.29E-04	1.16E-02
mosarqp1-2	0.01	29	13	5	4.13E-04	1.37E-02
mosarqp1-3	0.01	20	13	5	3.49E-04	1.18E-02
mosarqp1-4	0.01	28	13	5	4.26E-04	1.39E-02
mosarqp1-5	0.01	13	13	5	3.57E-04	1.26E-02
mosarqp1-ave	0.01	20.8	13.0	5.0	3.75E-04	1.27E-02
mosarqp2-1	0.0001	20	18	8	4.93E-04	3.23E-03
mosarqp2-2	0.0001	21	17	8	4.93E-04	3.23E-03
mosarqp2-3	0.0001	17	17	8	4.93E-04	3.23E-03
mosarqp2-4	0.0001	23	18	8	4.93E-04	3.23E-03
mosarqp2-5	0.0001	15	17	8	4.93E-04	3.23E-03
mosarqp2-ave	0.0001	19.2	17.4	8.0	4.93E-04	3.23E-03
mosarqp2-1	0.001	20	52	8	4.99E-04	3.25E-03
mosarqp2-2	0.001	21	52	8	4.98E-04	3.25E-03
mosarqp2-3	0.001	17	17	8	4.99E-04	3.25E-03
mosarqp2-4	0.001	23	17	8	5.02E-04	3.26E-03
mosarqp2-5	0.001	15	17	8	4.99E-04	3.25E-03
mosarqp2-ave	0.001	19.2	31.0	8.0	5.00E-04	3.25E-03
mosarqp2-1	0.01	20	13	8	5.60E-04	3.45E-03
mosarqp2-2	0.01	21	12	8	5.59E-04	3.45E-03
mosarqp2-3	0.01	17	19	8	5.92E-04	3.55E-03
mosarqp2-4	0.01	23	16	8	6.06E-04	3.60E-03
mosarqp2-5	0.01	15	17	8	5.94E-04	3.56E-03
mosarqp2-ave	0.01	19.2	15.4	8.0	5.82E-04	3.52E-03
powell20-1	0.0001	31	350	15	1.00E-04	4.67E-03
powell20-2	0.0001	14	349	16	1.60E-04	7.98E-03
powell20-3	0.0001	19	354	17	1.81E-04	3.23E-03
powell20-4	0.0001	28	353	14	1.66E-04	4.93E-03
powell20-5	0.0001	27	351	15	1.95E-04	4.22E-03
powell20-ave	0.0001	23.8	351.4	15.4	1.60E-04	5.01E-03
powell20-1	0.001	31	365	19	9.94E-04	2.42E-03
powell20-2	0.001	14	382	18	1.69E-03	4.51E-03
powell20-3	0.001	19	362	17	2.09E-03	5.95E-03
powell20-4	0.001	28	386	18	1.78E-03	4.79E-03
powell20-5	0.001	27	370	18	2.00E-03	5.96E-03
powell20-ave	0.001	23.8	373.0	18.0	1.71E-03	4.73E-03
powell20-1	0.01	31	376	18	9.87E-03	1.35E-02
powell20-2	0.01	14	349	26	1.74E-02	5.23E-02
powell20-3	0.01	19	364	30	2.01E-02	5.73E-02
powell20-4	0.01	28	365	16	1.88E-02	5.61E-02
powell20-5	0.01	27	363	28	2.09E-02	6.64E-02
powell20-ave	0.01	23.8	363.4	23.6	1.74E-02	4.91E-02

TABLE 4. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.

Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
qpcboei1-1	0.0001	24	61	167	2.13E-05	3.42E+00
qpcboei1-2	0.0001	23	63	80	4.80E-05	3.41E+00
qpcboei1-3	0.0001	18	63	128	9.66E-06	3.42E+00
qpcboei1-4	0.0001	20	63	95	1.36E-05	3.42E+00
qpcboei1-5	0.0001	12	62	97	8.77E-07	3.42E+00
qpcboei1-ave	0.0001	19.4	62.4	113.4	1.87E-05	3.42E+00
qpcboei1-1	0.001	24	64	84	2.13E-04	3.42E+00
qpcboei1-2	0.001	23	64	104	4.80E-04	3.36E+00
qpcboei1-3	0.001	18	61	81	9.66E-05	3.42E+00
qpcboei1-4	0.001	20	65	112	1.36E-04	3.42E+00
qpcboei1-5	0.001	12	62	178	8.77E-06	3.42E+00
qpcboei1-ave	0.001	19.4	63.2	111.8	1.87E-04	3.41E+00
qpcboei1-1	0.01	24	60	129	2.13E-03	3.42E+00
qpcboei1-2	0.01	23	64	141	4.80E-03	3.04E+00
qpcboei1-3	0.01	18	57	83	9.66E-04	3.42E+00
qpcboei1-4	0.01	20	65	117	1.36E-03	3.42E+00
qpcboei1-5	0.01	12	64	94	8.77E-05	3.42E+00
qpcboei1-ave	0.01	19.4	62.0	112.8	1.87E-03	3.34E+00
qpcboei2-1	0.0001	12	102	65	8.61E-07	4.75E+00
qpcboei2-2	0.0001	15	104	500	6.15E-07	6.25E+01
qpcboei2-3	0.0001	15	107	69	1.11E-04	3.98E+00
qpcboei2-4	0.0001	11	109	68	7.04E-06	3.79E+00
qpcboei2-5	0.0001	10	101	64	1.36E-06	4.90E+00
qpcboei2-ave	0.0001	12.6	104.6	153.2	2.42E-05	1.60E+01
qpcboei2-1	0.001	12	500	500	8.61E-06	4.11E+02
qpcboei2-2	0.001	15	500	500	6.15E-06	1.11E+02
qpcboei2-3	0.001	15	104	78	1.11E-03	3.67E+00
qpcboei2-4	0.001	11	101	69	7.04E-05	3.67E+00
qpcboei2-5	0.001	10	500	500	1.36E-05	4.03E+02
qpcboei2-ave	0.001	12.6	341.0	329.4	2.42E-04	1.87E+02
qpcboei2-1	0.01	12	500	500	8.61E-05	3.09E+03
qpcboei2-2	0.01	15	500	500	6.15E-05	4.85E+03
qpcboei2-3	0.01	15	106	67	1.11E-02	3.67E+00
qpcboei2-4	0.01	11	103	67	7.04E-04	3.67E+00
qpcboei2-5	0.01	10	500	500	1.36E-04	2.93E+03
qpcboei2-ave	0.01	12.6	341.8	326.8	2.42E-03	2.17E+03
qpcstair-1	0.0001	19	189	28	9.61E-05	2.92E-02
qpcstair-2	0.0001	26	189	28	9.58E-05	2.92E-02
qpcstair-3	0.0001	18	189	28	9.60E-05	2.92E-02
qpcstair-4	0.0001	13	192	30	2.46E-05	7.04E-01
qpcstair-5	0.0001	29	191	28	1.24E-04	2.91E-02
qpcstair-ave	0.0001	21.0	190.0	28.4	8.73E-05	1.64E-01
qpcstair-1	0.001	19	189	28	9.99E-05	2.92E-02
qpcstair-2	0.001	26	189	28	9.56E-05	2.92E-02
qpcstair-3	0.001	18	189	28	1.04E-04	2.92E-02
qpcstair-4	0.001	13	196	29	7.47E-05	6.47E-01
qpcstair-5	0.001	29	189	28	7.92E-04	2.89E-02
qpcstair-ave	0.001	21.0	190.4	28.2	2.33E-04	1.53E-01
qpcstair-1	0.01	19	190	28	2.49E-04	2.95E-02
qpcstair-2	0.01	26	189	28	1.02E-04	2.91E-02
qpcstair-3	0.01	18	187	28	4.20E-04	2.93E-02
qpcstair-4	0.01	13	195	28	5.40E-04	8.87E-01
qpcstair-5	0.01	29	182	29	7.86E-03	2.62E-02
qpcstair-ave	0.01	21.0	188.6	28.2	1.83E-03	2.00E-01

TABLE 5. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.

Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
s224-1	0.0001	1	10	3	5.97E-05	6.04E-04
s224-2	0.0001	1	10	3	7.66E-06	2.16E-04
s224-3	0.0001	1	10	3	8.76E-05	7.32E-04
s224-4	0.0001	2	10	3	7.30E-05	6.68E-04
s224-5	0.0001	1	10	3	1.72E-05	3.25E-04
s224-ave	0.0001	1.2	10.0	3.0	4.90E-05	5.09E-04
s224-1	0.001	1	10	5	5.97E-04	1.92E-03
s224-2	0.001	1	10	3	7.48E-05	6.77E-04
s224-3	0.001	1	10	3	8.74E-04	2.33E-03
s224-4	0.001	2	10	3	7.28E-04	2.13E-03
s224-5	0.001	1	10	4	1.74E-04	1.03E-03
s224-ave	0.001	1.2	10.0	3.6	4.90E-04	1.62E-03
s224-1	0.01	1	10	7	5.97E-03	6.42E-03
s224-2	0.01	1	10	3	7.46E-04	2.15E-03
s224-3	0.01	1	10	4	8.74E-03	7.96E-03
s224-4	0.01	2	10	4	7.28E-03	7.17E-03
s224-5	0.01	1	10	6	1.74E-03	3.32E-03
s224-ave	0.01	1.2	10.0	4.8	4.90E-03	5.40E-03
s392-1	0.0001	3	38	17	5.21E-06	3.57E-02
s392-2	0.0001	2	32	13	3.36E-05	9.49E-04
s392-3	0.0001	2	32	13	2.75E-05	9.44E-04
s392-4	0.0001	4	32	13	3.07E-05	9.44E-04
s392-5	0.0001	3	32	13	1.26E-05	9.36E-04
s392-ave	0.0001	2.8	33.2	13.8	2.19E-05	7.89E-03
s392-1	0.001	3	36	17	5.21E-05	3.57E-02
s392-2	0.001	2	31	13	3.36E-04	1.08E-03
s392-3	0.001	2	32	13	2.75E-04	1.02E-03
s392-4	0.001	4	32	13	3.07E-04	1.03E-03
s392-5	0.001	3	32	13	1.26E-04	9.37E-04
s392-ave	0.001	2.8	32.6	13.8	2.19E-04	7.96E-03
s392-1	0.01	3	34	17	5.21E-04	3.57E-02
s392-2	0.01	2	29	14	3.36E-03	3.09E-03
s392-3	0.01	2	41	13	2.75E-03	2.15E-03
s392-4	0.01	4	38	13	3.07E-03	2.31E-03
s392-5	0.01	3	32	13	1.26E-03	1.13E-03
s392-ave	0.01	2.8	34.8	14.0	2.19E-03	8.88E-03
zecevic2-1	0.0001	1	11	5	2.17E-05	2.58E-03
zecevic2-2	0.0001	1	11	5	2.80E-05	2.94E-03
zecevic2-3	0.0001	1	11	5	5.18E-05	3.99E-03
zecevic2-4	0.0001	1	11	5	4.83E-05	3.85E-03
zecevic2-5	0.0001	1	11	5	1.72E-05	2.30E-03
zecevic2-ave	0.0001	1.0	11.0	5.0	3.34E-05	3.13E-03
zecevic2-1	0.001	1	11	5	2.17E-04	8.17E-03
zecevic2-2	0.001	1	11	5	2.80E-04	9.28E-03
zecevic2-3	0.001	1	11	5	5.18E-04	1.26E-02
zecevic2-4	0.001	1	11	5	4.83E-04	1.22E-02
zecevic2-5	0.001	1	11	5	1.72E-04	7.27E-03
zecevic2-ave	0.001	1.0	11.0	5.0	3.34E-04	9.91E-03
zecevic2-1	0.01	1	11	5	2.17E-03	2.58E-02
zecevic2-2	0.01	1	11	5	2.80E-03	2.94E-02
zecevic2-3	0.01	1	11	6	5.18E-03	3.99E-02
zecevic2-4	0.01	1	11	5	4.83E-03	3.85E-02
zecevic2-5	0.01	1	11	5	1.72E-03	2.30E-02
zecevic2-ave	0.01	1.0	11.0	5.2	3.34E-03	3.13E-02

TABLE 6. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint right-hand-sides, b, have been modified. Each problem is labeled under the column Problem, 5 instances of each problem are presented, "ave" refers to the average performance over the five problems, δ is the perturbation parameter, and #Pert is the number of perturbed coefficients. The iteration counts for the warmstart and coldstart solution of five perturbed problems are given, and the last 2 columns are the scaled Euclidean norm of the distance between the optimal solutions and the Lagrange multipliers of the initial and the perturbed problem.