Problem	δ	#Pert	ColdIters	WarmIters	$\|x^I - x^P\|$	$\|y^I - y^P\|$
biggsc4-1	0.0001	1	29	17	2.04E-06	7.19E-04
biggsc4-2	0.0001	1	30	16	2.62E-08	8.26E-05
biggsc4-3	0.0001	3	30	16	1.90E-08	7.02E-05
biggsc4-4	0.0001	3	30	19	1.68E-07	2.06E-04
biggsc4-5	0.0001	2	30	15	1.13E-05	1.69E-03
biggsc4-ave	0.0001	2.0	29.8	16.6	2.71E-06	5.54E-04
biggsc4-1	0.001	1	29	15	2.07E-05	2.29E-03
biggsc4-2	0.001	1	30	14	6.13E-08	1.86E-04
biggsc4-3	0.001	3	28	14	4.76E-08	1.55E-04
biggsc4-4	0.001	3	30	17	1.71E-06	6.58E-04
biggsc4-5	0.001	2	28	13	1.13E-04	5.35E-03
biggsc4-ave	0.001	2.0	29.0	14.6	2.71E-05	1.73E-03
biggsc4-1	0.01	1	33	12	2.08E-04	7.26E-03
biggsc4-2	0.01	1	30	11	3.30E-08	1.39E-03
biggsc4-3	0.01	3	33	12	5.96E-08	1.10E-03
biggsc4-4	0.01	3	29	15	1.70E-05	2.07E-03
biggsc4-5	0.01	2	30	10	1.13E-03	1.70E-02
biggsc4-ave	0.01	2.0	31.0	12.0	2.71E-04	5.77E-03
hatfldh-1	0.0001	1	25	17	2.02E-06	7.15E-04
hatfldh-2	0.0001	1	25	16	4.71E-08	1.10E-04
hatfldh-3	0.0001	3	25	16	1.84E-09	2.42E-05
hatfldh-4	0.0001	3	25	19	1.47E-07	1.93E-04
hatfldh-5	0.0001	2	25	15	1.13E-05	1.69E-03
hatfldh-ave	0.0001	2.0	25.0	16.6	2.70E-06	5.46E-04
hatfldh-1	0.001	1	25	15	2.07E-05	2.29E-03
hatfldh-2	0.001	1	25	14	8.21E-08	2.00E-04
hatfldh-3	0.001	3	25	14	6.84E-08	1.71E-04
hatfldh-4	0.001	3	25	17	1.69E-06	6.54E-04
hatfldh-5	0.001	2	25	13	1.13E-04	5.35E-03
hatfldh-ave	0.001	2.0	25.0	14.6	2.71E-05	1.73E-03
hatfldh-1	0.01	1	25	12	2.08E-04	7.26E-03
hatfldh-2	0.01	1	25	11	1.22E-08	1.38E-03
hatfldh-3	0.01	3	25	12	8.04E-08	1.10E-03
hatfldh-4	0.01	3	25	15	1.69E-05	2.07E-03
hatfldh-5	0.01	2	25	10	1.13E-03	1.70E-02
hatfldh-ave	0.01	2.0	25.0	12.0	2.71E-04	5.77E-03
hs035-1	0.0001	1	9	5	1.75E-06	1.75E-03
hs035-2	0.0001	1	9	5	3.87E-07	8.22E-04
hs035-3	0.0001	1	9	5	7.86E-07	1.17E-03
hs035-4	0.0001	1	9	5	6.65E-07	1.08E-03
hs035-5	0.0001	1	9	5	1.55E-06	1.64E-03
hs035-ave	0.0001	1.0	9.0	5.0	1.03E-06	1.29E-03
hs035-1	0.001	1	9	5	1.75E-05	5.52E-03
hs035-2	0.001	1	9	4	3.92E-06	2.61E-03
hs035-3	0.001	1	9	4	7.91E-06	3.71E-03
hs035-4	0.001	1	9	4	6.58E-06	3.39E-03
hs035-5	0.001	1	9	5	1.54E-05	5.19E-03
hs035-ave	0.001	1.0	9.0	4.4	1.03E-05	4.08E-03
hs035-1	0.01	1	9	5	1.75E-04	1.75E-02
hs035-2	0.01	1	9	5	3.90E-05	8.25E-03
hs035-3	0.01	1	9	6	7.88E-05	1.17E-02
hs035-4	0.01	1	9	6	6.60E-05	1.07E-02
hs035-5	0.01	1	9	6	1.54E-04	1.64E-02
hs035-ave	0.01	1.0	9.0	5.6	1.03E-04	1.29E-02

TABLE 1. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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	3	15	3	2.09E-08	1.20E-04
hs044-2	0.0001	2	15	4	1.12E-08	9.53E-05
hs044-3	0.0001	2	15	3	3.66E-08	1.59E-04
hs044-4	0.0001	2	15	4	1.76E-08	1.17E-04
hs044-5	0.0001	3	15	3	2.08E-08	1.20E-04
hs044-ave	0.0001	2.4	15.0	3.4	2.14E-08	1.22E-04
hs044-1	0.001	3	15	4	1.92E-08	1.32E-04
hs044-2	0.001	2	15	5	7.00E-09	3.79E-04
hs044-3	0.001	2	15	4	7.62E-09	7.91E-05
hs044-4	0.001	2	15	4	7.41E-08	4.65E-04
hs044-5	0.001	3	15	4	2.63E-08	1.77E-04
hs044-ave	0.001	2.4	15.0	4.2	2.68E-08	2.46E-04
hs044-1	0.01	3	15	4	1.06E-07	7.03E-04
hs044-2	0.01	2	15	6	5.36E-09	3.72E-03
hs044-3	0.01	2	15	5	1.46E-08	3.35E-04
hs044-4	0.01	2	15	5	4.63E-08	4.10E-03
hs044-5	0.01	3	15	5	1.65E-08	1.16E-03
hs044-ave	0.01	2.4	15.0	5.0	3.78E-08	2.00E-03
hs076-1	0.0001	1	10	4	1.99E-06	1.73E-03
hs076-2	0.0001	1	10	4	3.85E-06	2.41E-03
hs076-3	0.0001	1	10	4	2.67E-06	2.00E-03
hs076-4	0.0001	1	10	4	9.24E-06	3.73E-03
hs076-5	0.0001	1	10	4	4.39E-06	2.57E-03
hs076-ave	0.0001	1.0	10.0	4.0	4.43E-06	2.49E-03
hs076-1	0.001	1	10	5	1.96E-05	5.43E-03
hs076-2	0.001	1	10	4	3.86E-05	7.62E-03
hs076-3	0.001	1	10	4	2.69E-05	6.36E-03
hs076-4	0.001	1	10	4	9.23E-05	1.18E-02
hs076-5	0.001	1	10	4	4.41E-05	8.14E-03
hs076-ave	0.001	1.0	10.0	4.2	4.43E-05	7.86E-03
hs076-1	0.01	1	10	6	1.96E-04	1.72E-02
hs076-2	0.01	1	10	5	3.86E-04	2.41E-02
hs076-3	0.01	1	10	4	2.70E-04	2.01E-02
hs076-4	0.01	1	10	4	9.24E-04	3.73E-02
hs076-5	0.01	1	10	4	4.42E-04	2.58E-02
hs076-ave	0.01	1.0	10.0	4.6	4.44E-04	2.49E-02
hs118-1	0.0001	3	15	4	6.77E-09	1.56E-04
hs118-2	0.0001	5	15	4	5.84E-09	1.45E-04
hs118-3	0.0001	4	15	4	8.96E-09	1.90E-04
hs118-4	0.0001	4	15	3	2.06E-09	8.60E-05
hs118-5	0.0001	5	15	3	3.78E-08	3.69E-04
hs118-ave	0.0001	4.2	15.0	3.6	1.23E-08	1.89E-04
hs118-1	0.001	3	15	4	9.09E-09	1.81E-04
hs118-2	0.001	5	15	5	6.73E-09	1.58E-04
hs118-3	0.001	4	15	5	3.33E-09	6.24E-04
hs118-4	0.001	4	15	4	6.44E-09	1.52E-04
hs118-5	0.001	5	15	4	2.09E-08	3.64E-04
hs118-ave	0.001	4.2	15.0	4.4	9.29E-09	2.96E-04
hs118-1	0.01	3	15	5	6.15E-09	2.05E-04
hs118-2	0.01	5	15	5	8.55E-09	3.17E-04
hs118-3	0.01	4	15	8	1.76E-08	6.15E-03
hs118-4	0.01	4	15	5	2.08E-09	8.63E-05
hs118-5	0.01	5	15	6	1.41E-09	2.40E-03
hs118-ave	0.01	4.2	15.0	5.8	7.16E-09	1.83E-03

TABLE 2. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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	2	19	4	8.79E-09	8.09E-05
hs44new-2	0.0001	1	19	4	1.32E-08	9.67E-05
hs44new-3	0.0001	1	19	4	2.18E-08	1.28E-04
hs44new-4	0.0001	2	19	4	1.29E-08	9.53E-05
hs44new-5	0.0001	1	19	4	8.03E-09	7.80E-05
hs44new-ave	0.0001	1.4	19.0	4.0	1.30E-08	9.57E-05
hs44new-1	0.001	2	19	5	4.44E-09	2.28E-04
hs44new-2	0.001	1	19	5	8.90E-09	1.71E-04
hs44new-3	0.001	1	19	4	7.43E-08	4.29E-04
hs44new-4	0.001	2	19	5	5.44E-09	1.47E-04
hs44new-5	0.001	1	19	5	5.64E-09	2.44E-04
hs44new-ave	0.001	1.4	19.0	4.8	1.98E-08	2.44E-04
hs44new-1	0.01	2	19	6	1.04E-08	2.20E-03
hs44new-2	0.01	1	19	6	1.27E-08	1.52E-03
hs44new-3	0.01	1	19	5	6.17E-08	3.67E-03
hs44new-4	0.01	2	19	6	9.74E-09	1.33E-03
hs44new-5	0.01	1	19	6	1.35E-08	2.35E-03
hs44new-ave	0.01	1.4	19.0	5.8	2.16E-08	2.22E-03
lsqfit-1	0.0001	1	8	4	8.26E-06	3.00E-03
lsqfit-2	0.0001	1	8	4	1.05E-06	1.07E-03
lsqfit-3	0.0001	1	8	4	3.71E-06	2.01E-03
lsqfit-4	0.0001	1	8	4	4.79E-06	2.28E-03
lsqfit-5	0.0001	1	8	3	1.20E-05	3.62E-03
lsqfit-ave	0.0001	1.0	8.0	3.8	5.97E-06	2.39E-03
lsqfit-1	0.001	1	8	4	8.27E-05	9.48E-03
lsqfit-2	0.001	1	8	3	1.03E-05	3.34E-03
lsqfit-3	0.001	1	8	4	3.73E-05	6.36E-03
lsqfit-4	0.001	1	8	4	4.81E-05	7.23E-03
lsqfit-5	0.001	1	8	5	1.21E-04	1.15E-02
lsqfit-ave	0.001	1.0	8.0	4.0	5.99E-05	7.58E-03
lsqfit-1	0.01	1	8	4	8.25E-04	2.99E-02
lsqfit-2	0.01	1	8	5	1.03E-04	1.06E-02
lsqfit-3	0.01	1	8	7	3.71E-04	2.01E-02
lsqfit-4	0.01	1	8	7	4.78E-04	2.28E-02
lsqfit-5	0.01	1	8	7	1.22E-03	3.64E-02
lsqfit-ave	0.01	1.0	8.0	6.0	5.99E-04	2.40E-02
mosarqp1-1	0.0001	20	13	5	2.52E-04	9.91E-03
mosarqp1-2	0.0001	23	13	5	2.52E-04	9.91E-03
mosarqp1-3	0.0001	17	13	5	2.52E-04	9.91E-03
mosarqp1-4	0.0001	19	13	5	2.52E-04	9.91E-03
mosarqp1-5	0.0001	25	13	5	2.52E-04	9.91E-03
mosarqp1-ave	0.0001	20.8	13.0	5.0	2.52E-04	9.91E-03
mosarqp1-1	0.001	20	13	5	2.45E-04	9.76E-03
mosarqp1-2	0.001	23	13	5	2.54E-04	9.95E-03
mosarqp1-3	0.001	17	13	5	2.53E-04	9.93E-03
mosarqp1-4	0.001	19	13	5	2.53E-04	9.93E-03
mosarqp1-5	0.001	25	13	5	2.53E-04	9.92E-03
mosarqp1-ave	0.001	20.8	13.0	5.0	2.52E-04	9.90E-03
mosarqp1-1	0.01	20	13	5	3.22E-04	1.11E-02
mosarqp1-2	0.01	23	13	5	2.89E-04	1.05E-02
mosarqp1-3	0.01	17	13	5	3.23E-04	1.11E-02
mosarqp1-4	0.01	19	13	5	3.55E-04	1.16E-02
mosarqp1-5	0.01	25	13	5	3.16E-04	1.10E-02
mosarqp1-ave	0.01	20.8	13.0	5.0	3.21E-04	1.11E-02

TABLE 3. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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	$\|x^I - x^P\|$	$\|y^I - y^P\|$
mosarqp2-1	0.0001	19	16	8	4.93E-04	3.23E-03
mosarqp2-2	0.0001	27	16	8	4.95E-04	3.23E-03
mosarqp2-3	0.0001	12	17	8	4.94E-04	3.23E-03
mosarqp2-4	0.0001	24	17	8	4.96E-04	3.24E-03
mosarqp2-5	0.0001	21	17	8	4.93E-04	3.23E-03
mosarqp2-ave	0.0001	20.6	16.6	8.0	4.94E-04	3.23E-03
mosarqp2-1	0.001	19	16	8	5.03E-04	3.26E-03
mosarqp2-2	0.001	27	16	8	5.15E-04	3.30E-03
mosarqp2-3	0.001	12	17	8	5.13E-04	3.29E-03
mosarqp2-4	0.001	24	15	8	5.29E-04	3.35E-03
mosarqp2-5	0.001	21	52	8	5.04E-04	3.27E-03
mosarqp2-ave	0.001	20.6	23.2	8.0	5.13E-04	3.30E-03
mosarqp2-1	0.01	19	16	8	6.93E-04	3.87E-03
mosarqp2-2	0.01	27	14	8	8.36E-04	4.29E-03
mosarqp2-3	0.01	12	18	8	7.25E-04	3.99E-03
mosarqp2-4	0.01	24	16	8	8.28E-04	4.30E-03
mosarqp2-5	0.01	21	12	8	7.45E-04	3.98E-03
mosarqp2-ave	0.01	20.6	15.2	8.0	7.66E-04	4.09E-03
powell20-1	0.0001	18	350	15	2.63E-05	5.68E-03
powell20-2	0.0001	24	351	15	6.27E-05	5.65E-03
powell20-3	0.0001	28	348	15	1.54E-05	5.65E-03
powell20-4	0.0001	22	350	15	2.18E-05	5.63E-03
powell20-5	0.0001	17	351	15	3.82E-06	5.62E-03
powell20-ave	0.0001	21.8	350.0	15.0	2.60E-05	5.65E-03
powell20-1	0.001	18	351	15	2.63E-04	5.88E-03
powell20-2	0.001	24	348	15	6.27E-04	5.76E-03
powell20-3	0.001	28	353	15	1.54E-04	5.81E-03
powell20-4	0.001	22	348	15	2.18E-04	5.50E-03
powell20-5	0.001	17	353	15	3.60E-05	5.51E-03
powell20-ave	0.001	21.8	350.6	15.0	2.59E-04	5.69E-03
powell20-1	0.01	18	349	15	2.63E-03	1.23E-02
powell20-2	0.01	24	357	15	6.28E-03	1.57E-02
powell20-3	0.01	28	385	15	1.55E-03	8.64E-03
powell20-4	0.01	22	348	15	2.18E-03	6.61E-03
powell20-5	0.01	17	371	15	3.59E-04	5.82E-03
powell20-ave	0.01	21.8	362.0	15.0	2.60E-03	9.83E-03
qpcboei1-1	0.0001	19	63	68	3.83E-06	3.42E+00
qpcboei1-2	0.0001	17	63	71	2.07E-06	3.42E+00
qpcboei1-3	0.0001	19	63	102	2.74E-06	3.42E+00
qpcboei1-4	0.0001	28	63	98	8.22E-06	3.42E+00
qpcboei1-5	0.0001	19	63	107	8.30E-07	3.42E+00
qpcboei1-ave	0.0001	20.4	63.0	89.2	3.54E-06	3.42E+00
qpcboei1-1	0.001	19	63	112	3.83E-05	3.42E+00
qpcboei1-2	0.001	17	63	75	1.53E-05	3.42E+00
qpcboei1-3	0.001	19	63	92	2.74E-05	3.42E+00
qpcboei1-4	0.001	28	63	73	7.86E-05	3.42E+00
qpcboei1-5	0.001	19	63	77	8.30E-06	3.42E+00
qpcboei1-ave	0.001	20.4	63.0	85.8	3.36E-05	3.42E+00
qpcboei1-1	0.01	19	63	69	3.84E-04	3.42E+00
qpcboei1-2	0.01	17	63	80	1.26E-04	3.42E+00
qpcboei1-3	0.01	19	63	89	2.74E-04	3.42E+00
qpcboei1-4	0.01	28	63	107	7.78E-04	3.42E+00
qpcboei1-5	0.01	19	63	88	8.32E-05	3.42E+00
qpcboei1-ave	0.01	20.4	63.0	86.6	3.29E-04	3.42E+00

TABLE 4. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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	$\|x^I - x^P\|$	$\|y^I - y^P\|$
qpcboei2-1	0.0001	24	101	68	6.32E-06	4.09E+00
qpcboei2-2	0.0001	23	101	79	5.55E-04	4.11E+00
qpcboei2-3	0.0001	17	101	67	4.41E-06	4.10E+00
qpcboei2-4	0.0001	16	101	65	2.08E-05	4.10E+00
qpcboei2-5	0.0001	15	101	64	7.07E-06	4.10E+00
qpcboei2-ave	0.0001	19.0	101.0	68.6	1.19E-04	4.10E+00
qpcboei2-1	0.001	24	101	61	6.33E-05	4.02E+00
qpcboei2-2	0.001	23	101	62	6.90E-03	3.76E+00
qpcboei2-3	0.001	17	101	82	4.41E-05	4.10E+00
qpcboei2-4	0.001	16	101	68	2.08E-04	4.10E+00
qpcboei2-5	0.001	15	101	63	7.07E-05	4.09E+00
qpcboei2-ave	0.001	19.0	101.0	67.2	1.46E-03	4.01E+00
qpcboei2-1	0.01	24	101	75	1.80E-03	4.06E+00
qpcboei2-2	0.01	23	101	67	1.46E-02	3.64E+00
qpcboei2-3	0.01	17	101	125	4.40E-04	4.10E+00
qpcboei2-4	0.01	16	101	69	2.09E-03	4.10E+00
qpcboei2-5	0.01	15	101	72	7.08E-04	4.10E+00
qpcboei2-ave	0.01	19.0	101.0	81.6	3.92E-03	4.00E+00
qpcstair-1	0.0001	17	189	28	9.59E-05	3.01E-02
qpcstair-2	0.0001	20	189	28	9.59E-05	3.00E-02
qpcstair-3	0.0001	18	189	28	9.59E-05	3.00E-02
qpcstair-4	0.0001	27	189	28	9.59E-05	3.00E-02
qpcstair-5	0.0001	17	189	28	9.59E-05	2.92E-02
qpcstair-ave	0.0001	19.8	189.0	28.0	9.59E-05	2.99E-02
qpcstair-1	0.001	17	189	28	9.59E-05	3.00E-02
qpcstair-2	0.001	20	189	28	1.01E-04	3.00E-02
qpcstair-3	0.001	18	189	28	9.59E-05	3.00E-02
qpcstair-4	0.001	27	189	28	9.58E-05	3.00E-02
qpcstair-5	0.001	17	189	28	9.57E-05	3.00E-02
qpcstair-ave	0.001	19.8	189.0	28.0	9.69E-05	3.00E-02
qpcstair-1	0.01	17	189	28	9.96E-05	3.00E-02
qpcstair-2	0.01	20	189	28	3.40E-04	3.00E-02
qpcstair-3	0.01	18	191	28	9.55E-05	3.01E-02
qpcstair-4	0.01	27	189	28	9.72E-05	3.02E-02
qpcstair-5	0.01	17	189	28	9.46E-05	3.00E-02
qpcstair-ave	0.01	19.8	189.4	28.0	1.45E-04	3.01E-02
s224-1	0.0001	1	10	3	7.50E-05	6.77E-04
s224-2	0.0001	1	10	3	1.57E-05	3.10E-04
s224-3	0.0001	1	10	3	9.97E-06	2.47E-04
s224-4	0.0001	1	10	4	1.11E-04	8.25E-04
s224-5	0.0001	2	10	4	9.27E-05	7.53E-04
s224-ave	0.0001	1.2	10.0	3.4	6.09E-05	5.62E-04
s224-1	0.001	1	10	4	7.55E-04	2.16E-03
s224-2	0.001	1	10	4	1.61E-04	9.97E-04
s224-3	0.001	1	10	4	9.50E-05	7.63E-04
s224-4	0.001	1	10	5	1.10E-03	2.62E-03
s224-5	0.001	2	10	5	9.21E-04	2.39E-03
s224-ave	0.001	1.2	10.0	4.4	6.07E-04	1.78E-03
s224-1	0.01	1	10	5	7.57E-03	7.14E-03
s224-2	0.01	1	10	6	1.62E-03	3.27E-03
s224-3	0.01	1	10	5	9.44E-04	2.42E-03
s224-4	0.01	1	10	8	1.10E-02	8.79E-03
s224-5	0.01	2	10	8	9.19E-03	7.94E-03
s224-ave	0.01	1.2	10.0	6.4	6.07E-03	5.91E-03

TABLE 5. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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	$\|x^I - x^P\|$	$\|y^I - y^P\|$
s392-1	0.0001	12	32	13	3.20E-05	9.47E-04
s392-2	0.0001	14	32	13	4.07E-05	9.80E-04
s392-3	0.0001	10	32	13	1.11E-04	9.49E-04
s392-4	0.0001	10	32	13	4.80E-05	8.47E-04
s392-5	0.0001	10	32	13	6.80E-05	9.32E-04
s392-ave	0.0001	11.2	32.0	13.0	6.00E-05	9.31E-04
s392-1	0.001	12	32	13	3.20E-04	1.07E-03
s392-2	0.001	14	32	16	4.07E-04	7.94E-04
s392-3	0.001	10	25	13	1.11E-03	1.18E-03
s392-4	0.001	10	32	13	4.80E-04	6.11E-04
s392-5	0.001	10	24	13	6.80E-04	9.52E-04
s392-ave	0.001	11.2	29.0	13.6	5.99E-04	9.21E-04
s392-1	0.01	12	40	14	3.20E-03	3.24E-03
s392-2	0.01	14	32	16	4.08E-03	3.98E-03
s392-3	0.01	10	23	14	1.11E-02	5.52E-03
s392-4	0.01	10	31	14	4.80E-03	4.46E-03
s392-5	0.01	10	35	13	6.77E-03	3.01E-03
s392-ave	0.01	11.2	32.2	14.2	5.98E-03	4.04E-03
zecevic2-1	0.0001	1	11	5	2.78E-06	9.24E-04
zecevic2-2	0.0001	1	11	5	8.32E-06	1.60E-03
zecevic2-3	0.0001	1	11	5	7.71E-06	1.54E-03
zecevic2-4	0.0001	1	11	5	9.94E-06	1.75E-03
zecevic2-5	0.0001	1	11	5	1.83E-05	2.37E-03
zecevic2-ave	0.0001	1.0	11.0	5.0	9.41E-06	1.64E-03
zecevic2-1	0.001	1	11	5	2.81E-05	2.94E-03
zecevic2-2	0.001	1	11	5	8.36E-05	5.07E-03
zecevic2-3	0.001	1	11	5	7.68E-05	4.86E-03
zecevic2-4	0.001	1	11	5	9.90E-05	5.52E-03
zecevic2-5	0.001	1	11	5	1.83E-04	7.50E-03
zecevic2-ave	0.001	1.0	11.0	5.0	9.41E-05	5.18E-03
zecevic2-1	0.01	1	11	6	2.81E-04	9.33E-03
zecevic2-2	0.01	1	11	7	8.33E-04	1.62E-02
zecevic2-3	0.01	1	11	6	7.67E-04	1.54E-02
zecevic2-4	0.01	1	11	7	9.91E-04	1.75E-02
zecevic2-5	0.01	1	11	5	1.83E-03	2.37E-02
zecevic2-ave	0.01	1.0	11.0	6.2	9.41E-04	1.64E-02

TABLE 6. Numerical performance of LOQO on the convex quadratic problems from the CUTEr test suite when warmstarting a problem whose constraint coefficients, A, 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.