

Detailed results for “Improved semidefinite bounding procedure for solving Max-Cut problems to optimality”

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Abstract

We provide the full numerical results that have been summarized in our paper “Improved semidefinite bounding procedure for solving Max-Cut problems to optimality” which is to appear in Mathematical Programming.

Table 1: CPU time (s) and nodes to solve the bqp50 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	11.19	5.03	23	7	0.35	0.25	1	1
2	0.31	0.31	1	1	0.58	0.24	1	1
3	0.11	0.11	1	1	0.98	0.17	1	1
4	0.25	0.25	1	1	0.63	0.22	1	1
5	0.20	0.20	1	1	0.31	0.21	1	1
6	0.13	0.13	1	1	0.25	0.21	1	1
7	0.22	0.22	1	1	0.27	0.26	1	1
8	0.16	0.16	1	1	0.26	0.19	1	1
9	0.18	0.18	1	1	0.29	0.25	1	1
10	0.45	0.45	1	1	0.29	0.24	1	1
Total:	6/10	6/10			0/10	4/10		

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Table 2: CPU time (s) and nodes to solve the bqp100 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	2.40	2.40	1	1	1.40	1.72	1	1
2	2.80	2.80	1	1	9.54	2.06	1	1
3	1.14	1.14	1	1	7.39	1.60	3	1
4	0.92	0.92	1	1	3.08	1.42	1	1
5	1.43	1.43	1	1	3.99	1.69	1	1
6	139.09	22.29	169	7	40.10	11.12	13	3
7	1.87	1.87	1	1	5.60	1.80	1	1
8	1.62	1.62	1	1	1.83	1.63	1	1
9	1.11	1.11	1	1	3.10	1.46	1	1
10	2.12	2.12	1	1	5.84	1.67	1	1
Total:	5/10	5/10			1/10	4/10		

Table 3: CPU time (s) and nodes to solve the bqp250 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	3709.00	1790.82	291	41	660.04	171.08	37	3
2	3094.08	1063.38	173	25	502.86	166.32	31	3
3	4220.53	526.18	309	11	65.49	47.13	1	1
4	3425.14	1615.88	243	37	53.04	185.95	1	3
5	3590.11	727.07	293	17	2122.92	55.17	101	1
6	3937.78	13014.86	309	323	2953.55	1213.87	331	19
7	3872.44	1119.27	297	25	917.86	173.05	55	3
8	54277.92	>360000.00	4341	>15387	40039.83	14714.12	5571	307
9	3398.68	3011.68	341	73	3241.21	373.52	263	7
10	3363.66	2452.87	233	59	2651.67	393.81	189	7
Total:	0/10	0/10			1/10	9/10		

Table 4: CPU time (s) and nodes to solve the gkaa problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	1.03	1.03	1	1	0.25	0.33	1	1
2	0.19	0.19	1	1	0.58	0.42	1	1
3	1.37	1.37	1	1	1.74	0.93	1	1
4	0.82	0.82	1	1	1.45	1.07	1	1
5	0.18	0.18	1	1	0.29	0.29	1	1
6	0.08	0.08	1	1	0.07	0.06	1	1
7	0.06	0.06	1	1	0.06	0.07	1	1
8	0.68	0.68	1	1	3.54	2.11	1	1
Total:	5/8	5/8			2/8	2/8		

Table 5: CPU time (s) and nodes to solve the gkab problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	1.11	1.11	1	1	1.83	0.10	13	1
2	5.97	9.54	43	33	4.76	2.18	29	3
3	12.69	33.03	47	83	11.95	9.44	53	13
4	29.59	108.85	89	173	24.36	18.42	79	27
5	66.27	300.14	161	335	39.20	42.15	85	43
6	131.01	1044.74	175	853	86.56	94.96	163	67
7	545.12	2509.01	551	1459	212.73	266.60	331	113
8	1630.28	11068.75	1623	6009	851.14	789.10	1379	331
9	3367.32	30173.75	3609	14173	2008.11	1608.04	3083	703
10	10719.44	178991.20	5881	43609	5104.21	7968.24	6309	2107
Total:	0/10	0/10			4/10	6/10		

Table 6: CPU time (s) and nodes to solve the gkac problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	0.16	0.16	1	1	0.13	0.15	1	1
2	0.17	0.17	1	1	0.27	0.25	1	1
3	0.38	0.38	1	1	0.44	0.43	1	1
4	0.97	0.97	1	1	0.73	0.86	1	1
5	0.72	0.72	1	1	1.36	0.93	1	1
6	1.02	1.02	1	1	1.97	1.54	1	1
7	0.94	0.94	1	1	2.99	1.95	1	1
Total:	5/7	5/7			2/7	0/7		

Table 7: CPU time (s) and nodes to solve the gkad problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	1.53	1.53	1	1	1.96	2.10	1	1
2	15.93	9.59	5	3	1.63	2.65	1	1
3	34.73	11.38	13	3	1.85	2.79	1	1
4	124.40	35.21	77	9	3.25	4.23	1	1
5	112.72	74.91	129	21	86.70	55.72	125	11
6	73.86	10.09	31	3	2.14	3.03	1	1
7	118.68	79.33	123	25	84.20	46.04	111	9
8	57.30	11.26	21	3	3.08	2.94	1	1
9	127.02	50.54	139	15	100.76	34.08	103	7
10	124.43	45.92	117	13	114.69	30.97	93	5
Total:	1/10	1/10			4/10	5/10		

Table 8: CPU time (s) and nodes to solve the gkae problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	1391.44	126.98	129	5	285.89	21.77	37	1
2	1902.51	13839.63	413	665	1047.08	2581.48	373	87
3	1436.94	25243.00	241	289	896.16	1159.87	237	43
4	1393.70	3876.28	311	177	928.96	869.92	293	31
5	25721.41	>360000.00	4717	>9097	16654.15	41480.79	4977	1705
Total:	0/5	0/5			3/5	2/5		

Table 9: CPU time (s) and nodes to solve the be100.d100 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	145.63	19.84	107	5	8.07	11.06	1	1
2	133.79	18.53	83	5	3.79	6.27	1	1
3	113.25	16.70	61	5	4.83	5.73	1	1
4	134.86	66.40	153	17	214.01	40.08	101	5
5	108.61	37.96	89	11	206.99	25.98	55	3
6	123.99	17.93	69	5	8.13	6.82	1	1
7	122.58	30.69	109	9	203.55	22.37	79	3
8	115.35	108.69	141	31	157.96	114.88	119	15
9	120.99	89.84	153	27	127.67	84.72	107	11
10	90.89	22.22	53	7	154.37	23.57	57	3
Total:	0/10	2/10			3/10	5/10		

Table 10: CPU time (s) and nodes to solve the be120.d30 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	223.63	113.27	161	19	432.05	76.30	125	5
2	92.97	15.33	23	3	8.99	7.18	1	1
3	120.97	16.76	31	3	11.50	7.76	1	1
4	248.71	40.07	137	7	14.49	12.88	1	1
5	147.27	25.69	43	5	6.25	8.12	1	1
6	40.13	14.98	9	3	7.25	6.57	1	1
7	6.10	6.10	1	1	9.42	6.77	1	1
8	4.52	4.52	1	1	5.01	6.62	1	1
9	168.79	64.48	67	11	293.80	38.91	61	3
10	164.08	25.17	55	5	9.13	12.15	1	1
Total:	2/10	2/10			2/10	6/10		

Table 11: CPU time (s) and nodes to solve the be120.d80 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	194.02	605.39	169	121	176.44	387.06	155	35
2	211.55	211.99	151	43	210.19	155.44	127	17
3	221.43	117.90	135	21	265.80	114.50	131	9
4	246.84	39.12	163	7	284.60	34.34	37	3
5	207.09	43.70	91	7	120.71	32.60	19	3
6	218.58	120.64	137	23	284.45	97.73	109	7
7	185.74	402.85	171	75	239.83	290.84	163	27
8	194.87	896.84	173	191	268.07	500.34	159	47
9	234.79	182.72	171	35	278.10	177.83	137	15
10	241.88	170.65	183	31	323.77	128.65	157	9
Total:	2/10	0/10			1/10	7/10		

Table 12: CPU time (s) and nodes to solve the be150.d30 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	552.72	170.68	145	15	784.90	111.72	101	7
2	487.97	162.74	125	15	750.87	90.88	125	7
3	229.30	39.21	29	3	11.00	7.74	1	1
4	656.06	111.98	181	9	27.47	32.53	1	3
5	560.44	344.08	193	31	769.36	101.60	181	7
6	529.45	2214.69	215	219	511.70	487.36	219	35
7	572.02	340.56	163	29	703.18	128.91	121	9
8	607.62	3461.01	243	359	665.17	909.82	243	63
9	844.33	5863.95	231	671	767.08	1072.17	227	87
10	528.52	4004.32	253	427	466.50	1004.20	225	65
Total:	1/10	0/10			3/10	6/10		

Table 13: CPU time (s) and nodes to solve the be150.d80 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	499.99	1207.49	225	129	483.87	593.74	195	49
2	536.48	7004.88	243	715	475.02	1872.56	233	155
3	441.62	3404.46	257	329	443.02	1019.10	239	71
4	526.56	591.11	167	59	468.46	363.55	151	27
5	482.92	1604.64	255	137	542.07	572.02	237	39
6	501.99	2033.05	223	201	536.32	802.06	205	59
7	525.18	5880.48	273	565	608.20	1211.89	217	95
8	507.49	1963.59	209	189	522.82	760.43	205	53
9	477.27	3903.36	253	413	544.90	1615.86	235	121
10	561.98	1634.39	217	157	480.67	568.80	207	43
Total:	6/10	0/10			3/10	1/10		

Table 14: CPU time (s) and nodes to solve the be200.d30 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	43850.81	>360000.00	7927	>25405	32612.82	56902.36	8985	2399
2	2553.97	87629.96	461	2627	1479.82	10624.76	503	355
3	1570.50	9464.23	305	351	798.46	1345.49	285	43
4	2597.34	90241.20	527	2251	844.91	7671.43	369	253
5	1630.94	52812.92	339	1121	808.48	4523.10	343	155
6	2054.03	34443.12	395	801	778.60	3057.63	293	119
7	1571.54	1079.71	195	25	642.16	102.61	69	3
8	4503.36	83747.75	685	2097	1135.38	5076.93	373	209
9	7737.93	74078.57	1217	2639	2551.76	6329.74	693	251
10	14656.52	319573.82	2359	11431	7407.25	22016.54	1935	861
Total:	0/10	0/10			9/10	1/10		

Table 15: CPU time (s) and nodes to solve the be200.d80 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	1210.52	25458.48	307	951	1572.38	4581.21	321	137
2	35247.12	>360000.00	5907	>34105	25518.98	81821.55	6581	3597
3	26318.86	>360000.00	6069	>23691	14474.43	64771.02	6067	2789
4	1866.05	77647.69	403	1785	1062.46	7627.42	389	305
5	9189.31	241577.21	1671	6189	4949.74	17366.65	1417	743
6	1580.43	3643.09	355	87	1051.23	596.22	239	21
7	1344.09	77552.67	345	1963	712.30	6756.64	333	265
8	25950.40	>360000.00	4941	>14429	16204.96	44663.86	5053	1895
9	1499.53	11130.84	259	211	930.82	935.36	253	37
10	2722.89	111291.76	509	3035	1574.58	8805.80	441	363
Total:	1/10	0/10			8/10	1/10		

Table 16: CPU time (s) and nodes to solve the be250.d10 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
1	3703.05	2098.62	319	49	2473.27	182.31	255	3
2	3611.26	1516.95	277	35	3618.13	176.91	367	3
3	3996.90	896.11	187	19	34.85	51.04	1	1
4	4157.19	1522.45	353	35	1518.58	151.37	153	3
5	3754.20	4516.16	305	113	2731.70	903.37	361	15
6	3471.50	3285.36	225	83	2440.30	432.71	215	7
7	2394.79	328.64	81	7	27.98	39.76	1	1
8	3675.89	3826.01	295	87	2980.22	529.83	307	9
9	3636.68	3992.81	311	97	3243.97	905.98	411	13
10	3664.60	3708.73	451	85	3920.43	751.78	443	13
Total:	0/10	0/10			2/10	8/10		

Table 17: CPU time (s) and nodes to solve the g05.n60 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	6.91	3.34	15	5	8.74	2.15	19	3
1	1.98	2.02	3	3	0.89	1.00	1	1
2	9.08	6.87	17	11	7.08	7.83	23	11
3	0.26	0.26	1	1	0.67	0.99	1	1
4	13.27	21.45	43	41	24.84	28.31	51	31
5	0.34	0.34	1	1	5.89	5.00	5	3
6	11.04	8.42	29	15	12.08	9.31	37	11
7	13.36	4.48	33	7	7.52	12.83	15	7
8	7.95	5.23	17	9	6.98	4.95	19	7
9	13.26	14.39	43	23	15.35	11.80	39	25
Total:	3/10	5/10			1/10	3/10		

Table 18: CPU time (s) and nodes to solve the g05.n80 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	49.16	66.56	77	61	55.22	43.71	89	47
1	14.25	6.39	13	5	2.80	3.66	1	1
2	34.09	20.54	43	17	18.88	22.24	45	15
3	274.50	512.58	385	533	296.10	386.78	571	355
4	40.71	52.76	69	45	43.36	36.54	79	29
5	52.10	53.65	71	49	67.16	75.93	109	77
6	36.44	40.81	59	33	42.73	36.54	71	31
7	24.45	18.48	29	15	28.41	18.26	43	17
8	51.92	64.20	71	61	73.96	37.41	131	47
9	80.64	141.93	113	141	119.53	73.64	199	87
Total:	3/10	0/10			2/10	5/10		

Table 19: CPU time (s) and nodes to solve the g05.n100 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	665.41	2194.05	547	1301	1060.48	663.41	1105	417
1	4197.29	14856.75	3533	9565	4527.49	3382.27	5345	2293
2	151.21	448.26	125	237	291.61	209.21	399	113
3	1540.31	4409.16	1157	2803	2143.00	1304.29	2533	859
4	93.45	133.74	75	67	104.66	96.05	105	51
5	126.56	339.26	117	171	325.38	182.40	313	97
6	197.72	422.34	181	227	346.61	237.33	355	131
7	351.58	1176.15	297	633	479.94	540.45	567	283
8	344.37	904.24	261	509	643.44	331.47	719	257
9	370.94	852.80	279	503	599.54	326.16	671	275
Total:	5/10	0/10			0/10	5/10		

Table 20: CPU time (s) and nodes to solve the pm1s80.d090 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	0.65	0.65	1	1	1.64	1.19	1	1
1	0.58	0.58	1	1	1.63	1.50	1	1
2	26.71	23.96	27	17	26.74	13.40	41	13
3	1.19	1.19	1	1	1.73	1.90	1	1
4	0.65	0.65	1	1	0.96	2.33	1	1
5	0.90	0.90	1	1	1.05	1.22	1	1
6	14.74	12.53	13	9	7.88	6.61	13	3
7	1.33	1.33	1	1	7.41	4.41	11	3
8	17.59	4.64	15	3	3.22	8.08	3	7
9	1.13	1.13	1	1	5.10	6.20	1	1
Total:	7/10	7/10			1/10	2/10		

Table 21: CPU time (s) and nodes to solve the pm1s100.d010 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	26.44	27.62	15	15	55.87	16.78	49	13
1	130.28	143.84	93	93	190.01	88.48	193	47
2	18.80	20.78	9	9	24.77	12.27	29	9
3	100.00	110.81	59	59	286.00	67.01	305	45
4	80.33	88.18	51	51	63.50	39.82	75	25
5	27.45	30.03	15	15	73.63	33.63	89	23
6	80.07	88.12	51	51	137.16	71.86	171	47
7	1.15	1.15	1	1	1.85	2.55	1	1
8	10.88	12.16	5	5	34.03	5.95	29	3
9	23.26	25.69	11	11	9.39	13.08	5	5
Total:	2/10	1/10			1/10	7/10		

Table 22: CPU time (s) and nodes to solve the pm1d80.d090 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	33.17	27.54	51	23	37.43	15.07	59	17
1	111.02	293.45	173	275	114.29	171.07	243	131
2	64.88	131.77	99	113	43.10	55.73	113	57
3	30.36	31.32	39	27	30.85	18.44	45	19
4	37.74	46.06	65	37	31.43	44.47	75	45
5	212.47	419.49	307	405	138.19	177.21	365	185
6	105.25	114.51	147	109	67.88	58.97	149	65
7	64.04	211.43	111	183	109.78	98.84	253	111
8	41.18	44.06	59	37	30.98	33.19	65	37
9	29.88	24.56	35	21	28.31	13.74	47	15
Total:	2/10	0/10			4/10	4/10		

Table 23: CPU time (s) and nodes to solve the pm1d100.d090 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	1229.18	8419.09	911	2281	1414.77	1026.52	1507	667
1	2868.06	17301.82	2157	4717	3236.25	1800.63	3575	1207
2	1863.13	11310.46	1375	3523	2047.23	1092.72	2443	823
3	376.93	1955.87	281	553	379.67	386.88	587	275
4	1651.17	4804.95	1203	2241	1138.05	948.92	1771	729
5	381.03	1900.61	271	475	335.83	276.72	485	189
6	350.15	1289.96	243	305	246.31	207.73	389	139
7	106.24	499.16	109	109	80.74	114.22	141	65
8	134.02	358.58	99	81	116.56	56.94	133	39
9	494.13	2500.91	355	637	430.41	336.99	529	241
Total:	1/10	0/10			1/10	8/10		

Table 24: CPU time (s) and nodes to solve the w100.d010 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	27.70	7.09	13	3	5.28	12.13	1	1
1	57.66	17.95	35	3	43.34	21.59	23	3
2	131.45	296.92	77	137	595.77	152.09	491	47
3	43.14	13.46	23	5	35.67	13.81	33	5
4	2.12	2.12	1	1	1.85	2.47	1	1
5	18.31	16.32	9	7	24.89	9.76	17	3
6	2.35	2.35	1	1	2.22	2.64	1	1
7	50.86	31.53	27	13	24.06	26.43	23	11
8	1.37	1.37	1	1	1.71	2.08	1	1
9	12.45	7.85	5	3	2.30	2.69	1	1
Total:	2/10	3/10			5/10	1/10		

Table 25: CPU time (s) and nodes to solve the w100.d050 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	945.25	2164.97	737	1217	1335.05	1061.46	969	459
1	211.42	515.41	191	263	290.43	311.70	229	109
2	175.46	357.04	143	177	186.81	202.08	175	63
3	612.54	2087.57	489	1159	825.00	563.16	949	319
4	1040.41	2704.91	835	1499	964.91	720.19	1125	357
5	1027.07	2436.14	789	1331	1137.77	802.39	1349	413
6	220.65	587.59	171	305	188.11	189.44	223	93
7	137.39	196.16	105	93	84.50	86.61	93	39
8	1152.49	2879.08	875	1637	1069.53	775.14	1255	465
9	109.99	135.18	91	65	81.02	83.06	87	33
Total:	3/10	0/10			3/10	4/10		

Table 26: CPU time (s) and nodes to solve the w100.d090 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	539.51	1163.23	411	629	1038.44	770.67	653	271
1	2945.89	14097.89	2525	8485	5897.16	4675.78	4413	1821
2	1364.49	4619.19	1087	2711	1167.26	1519.29	1179	765
3	1487.39	6598.30	1199	3939	1637.23	1630.03	1789	897
4	717.48	1943.66	589	1065	800.85	608.70	845	293
5	79.69	38.67	57	17	28.48	26.50	23	9
6	89.86	190.11	103	87	131.40	138.67	131	57
7	377.18	949.78	271	509	374.73	299.03	391	157
8	205.76	439.04	213	209	187.90	225.81	209	105
9	596.26	1637.01	459	903	571.00	473.28	637	267
Total:	4/10	0/10			2/10	4/10		

Table 27: CPU time (s) and nodes to solve the pw100.d010 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	32.32	28.47	15	11	94.80	27.52	63	13
1	144.42	112.86	107	47	82.52	49.65	83	15
2	53.49	57.39	33	25	174.22	49.84	123	21
3	95.28	120.84	61	55	109.82	35.61	99	15
4	15.11	8.02	7	3	2.64	3.10	1	1
5	20.20	8.33	9	3	2.50	3.20	1	1
6	56.65	51.35	29	23	37.24	23.02	35	11
7	89.73	65.23	57	27	60.77	42.09	57	15
8	1.64	1.64	1	1	2.06	2.15	1	1
9	228.70	244.33	157	111	172.00	113.86	191	43
Total:	1/10	1/10			2/10	7/10		

Table 28: CPU time (s) and nodes to solve the pw100.d050 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	1798.61	7433.26	1447	4679	3732.88	2506.69	2949	1161
1	529.82	1787.33	413	1033	692.52	628.58	745	357
2	831.04	2315.65	697	1381	1136.32	710.04	1095	373
3	145.66	371.98	119	197	164.25	157.69	185	85
4	911.92	2763.95	765	1629	1188.62	970.65	1305	549
5	232.10	374.56	169	201	232.79	218.71	259	117
6	1726.73	5507.96	1401	3327	1751.65	1359.81	2031	737
7	454.48	913.14	333	485	384.06	300.39	429	153
8	122.67	196.11	121	91	103.26	81.34	113	37
9	406.52	1093.26	315	611	390.92	397.39	445	219
Total:	4/10	0/10			1/10	5/10		

Table 29: CPU time (s) and nodes to solve the pw100.d090 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
0	753.88	4508.30	559	1175	1122.32	677.50	979	321
1	971.02	6800.50	723	1827	1113.34	883.57	1237	485
2	362.03	1957.67	267	501	354.55	334.49	405	199
3	209.02	1261.49	155	301	201.61	255.36	215	131
4	544.85	2324.07	401	575	396.38	363.92	467	195
5	647.55	3797.79	533	919	605.58	658.84	733	337
6	577.00	2826.12	391	717	448.18	405.48	541	261
7	1297.98	8382.66	981	2253	1112.62	1061.18	1375	621
8	381.88	2154.22	303	515	347.05	313.59	393	175
9	323.01	1536.21	247	369	247.90	288.67	289	145
Total:	0/10	0/10			3/10	7/10		

Table 30: CPU time (s) and nodes to solve the ising100 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
251005555	165.65	19.86	113	7	2.86	3.15	1	1
251006666	141.74	9.41	65	3	2.62	2.96	1	1
251007777	145.33	10.01	75	3	2.96	2.76	1	1
301005555	142.05	18.78	99	7	3.87	4.51	1	1
301006666	69.03	7.74	115	3	4.36	2.98	1	1
301007777	33.13	10.76	11	3	3.51	3.14	1	1
Total:	0/6	0/6			3/6	3/6		

Table 31: CPU time (s) and nodes to solve the ising150 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
251505555	505.60	54.44	99	7	14.49	12.89	1	1
251506666	1060.72	70.97	151	7	9.04	8.48	1	1
251507777	630.15	85.74	139	9	10.79	12.19	1	1
301505555	538.02	48.18	199	5	15.86	11.72	1	1
301506666	651.94	59.97	141	7	7.94	7.74	1	1
301507777	460.91	42.55	191	5	15.38	12.57	1	1
Total:	0/6	0/6			1/6	5/6		

Table 32: CPU time (s) and nodes to solve the ising200 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
252005555	1880.36	150.39	231	9	23.37	19.72	1	1
252006666	2923.63	194.08	317	9	24.72	27.52	1	1
252007777	2139.40	403.19	475	19	27.20	30.21	1	1
302005555	1329.85	212.69	273	11	27.77	23.75	1	1
302006666	2529.97	247.57	271	13	39.85	37.59	1	1
302007777	1054.57	195.99	255	9	31.61	30.58	1	1
Total:	0/6	0/6			2/6	4/6		

Table 33: CPU time (s) and nodes to solve the ising250 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
252505555	3440.53	2161.49	393	59	3490.20	406.84	125	7
252506666	4499.77	885.76	145	25	53.01	174.96	1	3
252507777	3600.15	1066.09	641	27	3548.82	213.82	201	3
302505555	8293.36	1029.29	859	29	47.88	61.41	1	1
302506666	4366.78	165.79	501	5	52.41	53.64	1	1
302507777	3013.34	580.93	191	17	55.69	73.98	1	1
Total:	0/6	0/6			4/6	2/6		

Table 34: CPU time (s) and nodes to solve the ising300 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
253005555	21859.40	3420.25	931	55	102.98	143.62	1	1
253006666	23203.24	4624.07	1839	71	110.44	121.36	1	1
253007777	27282.55	11858.56	1327	175	7108.80	1628.66	141	15
303005555	7605.89	1201.86	545	19	118.33	99.26	1	1
303006666	4235.17	991.28	131	15	1549.33	97.43	23	1
303007777	8623.52	3516.96	541	57	6342.78	695.85	123	5
Total:	0/6	0/6			2/6	4/6		

Table 35: CPU time (s) and nodes to solve the t2g10 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	1.98	1.98	1	1	5.30	5.48	1	1
6666	1.63	1.63	1	1	3.63	4.30	1	1
7777	3.04	3.04	1	1	3.50	4.40	1	1
Total:	3/3	3/3			0/3	0/3		

Table 36: CPU time (s) and nodes to solve the t2g15 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	157.29	56.55	3	3	38.87	43.13	1	1
6666	79.80	73.34	3	3	42.44	49.30	1	1
7777	245.17	69.18	5	3	46.03	57.02	1	1
Total:	0/3	0/3			3/3	0/3		

Table 37: CPU time (s) and nodes to solve the t2g20 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	24877.86	1014.38	225	7	351.37	386.62	1	1
6666	72586.37	11132.18	715	75	33617.12	2748.55	447	7
7777	23906.54	1882.78	221	13	8668.10	377.79	27	1
Total:	0/3	0/3			1/3	2/3		

Table 38: CPU time (s) and nodes to solve the t3g5 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	3.22	3.22	1	1	7.35	7.18	1	1
6666	5.49	5.49	1	1	7.27	7.57	1	1
7777	4.55	4.55	1	1	7.71	8.55	1	1
Total:	3/3	3/3			0/3	0/3		

Table 39: CPU time (s) and nodes to solve the t3g6 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	62.40	52.34	3	3	41.85	48.24	1	1
6666	1882.42	367.12	165	17	3300.55	566.66	83	9
7777	116.28	58.61	5	3	46.16	54.61	1	1
Total:	0/3	1/3			2/3	0/3		

Table 40: CPU time (s) and nodes to solve the t3g7 problems.

Prob.	Biq Mac time		Biq Mac nodes		Our time		Our nodes	
	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)	(R2)	(R3)
5555	81.37	81.37	1	1	123.46	152.74	1	1
6666	111.89	111.89	1	1	156.69	178.42	1	1
7777	24999.25	17601.56	549	191	78224.93	11234.02	575	81
Total:	2/3	2/3			0/3	1/3		