

Bound constraints problems - Tables

Algorithm	Iterations	Time	CostEvals	Failures
SPG	12.0 ± 0.0	0.0069 ± 0.0009	13.0 ± 0.0	0
PGMM	6.0 ± 0.0	0.0043 ± 0.0006	22.0 ± 0.0	0

Table 1: Results for problem BDEXP

Algorithm	Iterations	Time	CostEvals	Failures
SPG	36065.0 ± 0.0	12.4065 ± 0.0973	54416.0 ± 0.0	0
PGMM	5798.0 ± 0.0	2.5526 ± 0.0108	23190.0 ± 0.0	0

Table 2: Results for problem BIGGSB1

Algorithm	Iterations	Time	CostEvals	Failures
SPG	24.0 ± 0.0	0.0043 ± 0.0005	37.0 ± 0.0	0
PGMM	29.0 ± 0.0	0.0051 ± 0.0003	125.0 ± 0.0	0

Table 3: Results for problem BQPGABIM

Algorithm	Iterations	Time	CostEvals	Failures
SPG	33.0 ± 0.0	0.0056 ± 0.0008	46.0 ± 0.0	0
PGMM	23.0 ± 0.0	0.0039 ± 0.0004	101.0 ± 0.0	0

Table 4: Results for problem BQPGASIM

Algorithm	Iterations	Time	CostEvals	Failures
SPG	61706.0 ± 0.0	16.4127 ± 0.0401	107719.0 ± 0.0	10
PGMM	8448.0 ± 0.0	2.7567 ± 0.0270	33803.0 ± 0.0	10

Table 5: Results for problem BQPGAUSS

Algorithm	Iterations	Time	CostEvals	Failures
SPG	8280.0 ± 0.0	14.0130 ± 0.0823	14049.0 ± 0.0	10
PGMM	1698.0 ± 0.0	4.4475 ± 0.0186	6798.0 ± 0.0	0

Table 6: Results for problem CHEBYQAD

Algorithm	Iterations	Time	CostEvals	Failures
SPG	4318.0 ± 0.0	1.6267 ± 0.0546	7168.0 ± 0.0	0
PGMM	2661.0 ± 0.0	1.2932 ± 0.0116	10642.0 ± 0.0	0

Table 7: Results for problem CHENHARK

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1.0 ± 0.0	0.0017 ± 0.0020	2.0 ± 0.0	0
PGMM	1.0 ± 0.0	0.0011 ± 0.0001	2.0 ± 0.0	0

Table 8: Results for problem CVXBQP1

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1494.0 ± 0.0	0.2251 ± 0.0095	2295.0 ± 0.0	0
PGMM	217.0 ± 0.0	0.0354 ± 0.0013	866.0 ± 0.0	0

Table 9: Results for problem DECONVB

Algorithm	Iterations	Time	CostEvals	Failures
SPG	270.0 ± 0.0	0.0456 ± 0.0036	333.0 ± 0.0	0
PGMM	126.0 ± 0.0	0.0225 ± 0.0013	512.0 ± 0.0	10

Table 10: Results for problem EXPLIN

Algorithm	Iterations	Time	CostEvals	Failures
SPG	278.0 ± 0.0	0.0481 ± 0.0042	420.0 ± 0.0	0
PGMM	83.0 ± 0.0	0.0149 ± 0.0008	331.0 ± 0.0	10

Table 11: Results for problem EXPLIN2

Algorithm	Iterations	Time	CostEvals	Failures
SPG	757.0 ± 0.0	0.1291 ± 0.0050	1171.0 ± 0.0	10
PGMM	79.0 ± 0.0	0.0150 ± 0.0001	319.0 ± 0.0	10

Table 12: Results for problem EXPQUAD

Algorithm	Iterations	Time	CostEvals	Failures
SPG	20.0 ± 0.0	0.0050 ± 0.0006	27.0 ± 0.0	0
PGMM	29.0 ± 0.0	0.0082 ± 0.0004	115.0 ± 0.0	0

Table 13: Results for problem HADAMALS

Algorithm	Iterations	Time	CostEvals	Failures
SPG	126.0 ± 0.0	0.1962 ± 0.0042	189.0 ± 0.0	0
PGMM	22.0 ± 0.0	0.0515 ± 0.0015	86.0 ± 0.0	0

Table 14: Results for problem HARKERP2

Algorithm	Iterations	Time	CostEvals	Failures
SPG	7.0 ± 0.0	0.0012 ± 0.0001	9.0 ± 0.0	0
PGMM	5.0 ± 0.0	0.0010 ± 0.0001	19.0 ± 0.0	0

Table 15: Results for problem HS110

Algorithm	Iterations	Time	CostEvals	Failures
SPG	5.0 ± 0.0	0.0010 ± 0.0002	7.0 ± 0.0	0
PGMM	3.0 ± 0.0	0.0009 ± 0.0001	11.0 ± 0.0	0

Table 16: Results for problem JNLBRNG1

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1016.0 ± 0.0	1.0989 ± 0.0107	1590.0 ± 0.0	0
PGMM	479.0 ± 0.0	0.7364 ± 0.0058	1914.0 ± 0.0	0

Table 17: Results for problem JNLBRNG2

Algorithm	Iterations	Time	CostEvals	Failures
SPG	660.0 ± 0.0	0.6244 ± 0.0096	1057.0 ± 0.0	0
PGMM	291.0 ± 0.0	0.3785 ± 0.0065	1163.0 ± 0.0	0

Table 18: Results for problem JNLBRNGA

Algorithm	Iterations	Time	CostEvals	Failures
SPG	10680.0 ± 0.0	10.1044 ± 0.0502	17627.0 ± 0.0	0
PGMM	1324.0 ± 0.0	1.7310 ± 0.0302	5295.0 ± 0.0	0

Table 19: Results for problem JNLBRNGB

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1078.0 ± 0.0	0.3483 ± 0.0075	1772.0 ± 0.0	0
PGMM	412.0 ± 0.0	0.1728 ± 0.0086	1646.0 ± 0.0	0

Table 20: Results for problem LINVERSE

Algorithm	Iterations	Time	CostEvals	Failures
SPG	15.0 ± 0.0	0.0098 ± 0.0008	16.0 ± 0.0	0
PGMM	13.0 ± 0.0	0.0108 ± 0.0003	50.0 ± 0.0	0

Table 21: Results for problem MCCORMCK

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1.0 ± 0.0	0.0018 ± 0.0022	2.0 ± 0.0	0
PGMM	1.0 ± 0.0	0.0010 ± 0.0001	2.0 ± 0.0	0

Table 22: Results for problem NCVXBQP1

Algorithm	Iterations	Time	CostEvals	Failures
SPG	76.0 ± 0.0	0.0435 ± 0.0041	83.0 ± 0.0	10
PGMM	40.0 ± 0.0	0.0335 ± 0.0016	176.0 ± 0.0	10

Table 23: Results for problem NCVXBQP2

Algorithm	Iterations	Time	CostEvals	Failures
SPG	107.0 ± 0.0	0.0561 ± 0.0026	113.0 ± 0.0	10
PGMM	62.0 ± 0.0	0.0497 ± 0.0017	259.0 ± 0.0	10

Table 24: Results for problem NCVXBQP3

Algorithm	Iterations	Time	CostEvals	Failures
SPG	236.0 ± 0.0	0.1452 ± 0.0105	350.0 ± 0.0	0
PGMM	147.0 ± 0.0	0.1200 ± 0.0057	592.0 ± 0.0	0

Table 25: Results for problem NOBNDTOR

Algorithm	Iterations	Time	CostEvals	Failures
SPG	41.0 ± 0.0	0.0173 ± 0.0015	42.0 ± 0.0	0
PGMM	28.0 ± 0.0	0.0144 ± 0.0002	110.0 ± 0.0	0

Table 26: Results for problem NONSCOMP

Algorithm	Iterations	Time	CostEvals	Failures
SPG	404.0 ± 0.0	0.3846 ± 0.0098	572.0 ± 0.0	0
PGMM	192.0 ± 0.0	0.2564 ± 0.0078	766.0 ± 0.0	0

Table 27: Results for problem OBSTCLAE

Algorithm	Iterations	Time	CostEvals	Failures
SPG	210.0 ± 0.0	0.2023 ± 0.0092	280.0 ± 0.0	0
PGMM	87.0 ± 0.0	0.1163 ± 0.0014	349.0 ± 0.0	0

Table 28: Results for problem OBSTCLAL

Algorithm	Iterations	Time	CostEvals	Failures
SPG	241.0 ± 0.0	0.2258 ± 0.0046	340.0 ± 0.0	0
PGMM	106.0 ± 0.0	0.1424 ± 0.0057	422.0 ± 0.0	0

Table 29: Results for problem OBSTCLBL

Algorithm	Iterations	Time	CostEvals	Failures
SPG	156.0 ± 0.0	0.1494 ± 0.0068	222.0 ± 0.0	0
PGMM	86.0 ± 0.0	0.1160 ± 0.0034	343.0 ± 0.0	0

Table 30: Results for problem OBSTCLBM

Algorithm	Iterations	Time	CostEvals	Failures
SPG	204.0 ± 0.0	0.1937 ± 0.0084	277.0 ± 0.0	0
PGMM	102.0 ± 0.0	0.1344 ± 0.0045	406.0 ± 0.0	0

Table 31: Results for problem OBSTCLBU

Algorithm	Iterations	Time	CostEvals	Failures
SPG	100000.0 ± 0.0	75.4462 ± 1.0604	162960.0 ± 0.0	10
PGMM	100000.0 ± 0.0	107.3698 ± 1.2700	399998.0 ± 0.0	10

Table 32: Results for problem ODNAMUR

Algorithm	Iterations	Time	CostEvals	Failures
SPG	1.0 ± 0.0	0.0016 ± 0.0022	3.0 ± 0.0	0
PGMM	1.0 ± 0.0	0.0008 ± 0.0000	3.0 ± 0.0	0

Table 33: Results for problem PENTDI

Algorithm	Iterations	Time	CostEvals	Failures
SPG	2.0 ± 0.0	0.0006 ± 0.0001	6.0 ± 0.0	0
PGMM	2.0 ± 0.0	0.0006 ± 0.0001	9.0 ± 0.0	0

Table 34: Results for problem PROBPENL

Algorithm	Iterations	Time	CostEvals	Failures
SPG	42572.0 ± 0.0	12.1452 ± 0.0717	91743.0 ± 0.0	10
PGMM	57391.0 ± 0.0	19.2342 ± 0.2189	229563.0 ± 0.0	0

Table 35: Results for problem QR3DLS

Algorithm	Iterations	Time	CostEvals	Failures
SPG	2157.0 ± 0.0	0.7344 ± 0.0181	3509.0 ± 0.0	10
PGMM	928.0 ± 0.0	0.3761 ± 0.0092	3726.0 ± 0.0	10

Table 36: Results for problem QRTQUAD

Algorithm	Iterations	Time	CostEvals	Failures
SPG	8.0 ± 0.0	0.0014 ± 0.0002	10.0 ± 0.0	0
PGMM	5.0 ± 0.0	0.0010 ± 0.0001	18.0 ± 0.0	0

Table 37: Results for problem S368

Algorithm	Iterations	Time	CostEvals	Failures
SPG	42572.0 ± 0.0	12.1928 ± 0.0810	91743.0 ± 0.0	10
PGMM	57391.0 ± 0.0	19.0344 ± 0.0833	229563.0 ± 0.0	0

Table 38: Results for problem SCON1LS

Algorithm	Iterations	Time	CostEvals	Failures
SPG	163.0 ± 0.0	0.0999 ± 0.0044	229.0 ± 0.0	0
PGMM	131.0 ± 0.0	0.1068 ± 0.0048	528.0 ± 0.0	0

Table 39: Results for problem TORSION1

Algorithm	Iterations	Time	CostEvals	Failures
SPG	211.0 ± 0.0	0.1336 ± 0.0056	310.0 ± 0.0	0
PGMM	129.0 ± 0.0	0.1103 ± 0.0075	514.0 ± 0.0	0

Table 40: Results for problem TORSION2

Algorithm	Iterations	Time	CostEvals	Failures
SPG	67.0 ± 0.0	0.0401 ± 0.0012	90.0 ± 0.0	0
PGMM	57.0 ± 0.0	0.0466 ± 0.0015	232.0 ± 0.0	0

Table 41: Results for problem TORSION3

Algorithm	Iterations	Time	CostEvals	Failures
SPG	87.0 ± 0.0	0.0546 ± 0.0022	108.0 ± 0.0	0
PGMM	49.0 ± 0.0	0.0433 ± 0.0026	194.0 ± 0.0	0

Table 42: Results for problem TORSION4

Algorithm	Iterations	Time	CostEvals	Failures
SPG	42.0 ± 0.0	0.0260 ± 0.0015	52.0 ± 0.0	0
PGMM	29.0 ± 0.0	0.0239 ± 0.0011	120.0 ± 0.0	0

Table 43: Results for problem TORSION5

Algorithm	Iterations	Time	CostEvals	Failures
SPG	59.0 ± 0.0	0.0366 ± 0.0021	70.0 ± 0.0	0
PGMM	26.0 ± 0.0	0.0215 ± 0.0009	102.0 ± 0.0	0

Table 44: Results for problem TORSION6

Algorithm	Iterations	Time	CostEvals	Failures
SPG	357.0 ± 0.0	0.2516 ± 0.0063	530.0 ± 0.0	0
PGMM	125.0 ± 0.0	0.1159 ± 0.0041	504.0 ± 0.0	0

Table 45: Results for problem TORSIONA

Algorithm	Iterations	Time	CostEvals	Failures
SPG	237.0 ± 0.0	0.1607 ± 0.0037	339.0 ± 0.0	0
PGMM	127.0 ± 0.0	0.1174 ± 0.0065	506.0 ± 0.0	0

Table 46: Results for problem TORSIONB

Algorithm	Iterations	Time	CostEvals	Failures
SPG	112.0 ± 0.0	0.0769 ± 0.0025	151.0 ± 0.0	0
PGMM	58.0 ± 0.0	0.0552 ± 0.0020	236.0 ± 0.0	0

Table 47: Results for problem TORSIONC

Algorithm	Iterations	Time	CostEvals	Failures
SPG	107.0 ± 0.0	0.0738 ± 0.0048	135.0 ± 0.0	0
PGMM	51.0 ± 0.0	0.0488 ± 0.0023	202.0 ± 0.0	0

Table 48: Results for problem TORSIOND

Algorithm	Iterations	Time	CostEvals	Failures
SPG	43.0 ± 0.0	0.0291 ± 0.0011	52.0 ± 0.0	0
PGMM	27.0 ± 0.0	0.0269 ± 0.0013	112.0 ± 0.0	0

Table 49: Results for problem TORSIONE

Algorithm	Iterations	Time	CostEvals	Failures
SPG	60.0 ± 0.0	0.0397 ± 0.0012	70.0 ± 0.0	0
PGMM	26.0 ± 0.0	0.0257 ± 0.0016	102.0 ± 0.0	0

Table 50: Results for problem TORSIONF