Supplementary Document

for

A Constraint Consensus Memetic Algorithm for Solving Constrained Optimization Problems

Noha M. Hamza, Ruhul A. Sarker, Daryl L. Essam, Kalyanmoy Deb and
Saber M. Elsayed

Appendix A

Function values obtained by GA-MPC, GA-MPC -CC, GA-MPC -DBmax, GA-MPC -FDfar, GA-MPC-M and CCMA out of 25 independent runs

Prob	Algorithm	Best	Median	Mean	Worst	St. d
g01	GA-MPC	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
	GA-MPC-CC	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
	GA-MPC-DBmax	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
	GA-MPC-FDfar	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
	GA-MPC-M	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
	CCMA	-15.000	-15.000	-15.00000	-15.00000	0.00000E+00
g02	GA-MPC	-0.80361832	-0.80361546	-0.79880538	-0.78656682	5.72607E-03
	GA-MPC-CC	-0.80361840	-0.80361449	-0.79803136	-0.78615673	6.88697E-03
	GA-MPC-DBmax	-0.80361840	-0.80361449	-0.79803136	-0.78615673	6.88697E-03
	GA-MPC-FDfar	-0.80361840	-0.80361449	-0.79803136	-0.78615673	6.88697E-03
	GA-MPC-M	-0.80361840	-0.80361449	-0.79803136	-0.78615673	6.88697E-03
	CCMA	-0.80361910	-0.79489705	-0.79650714	-0.78526659	7.06481E-03
g03	GA-MPC	-1.0005	-1.0005	-1.0005	-1.0005	8.58304E-09
	GA-MPC-CC	-1.0005	-1.0005	-1.0005	-1.0005	1.27568E-08
	GA-MPC-DBmax	-1.0005	-1.0005	-1.0005	-1.0005	1.27568E-08
	GA-MPC-FDfar	-1.0005	-1.0005	-1.0005	-1.0005	1.27568E-08
	GA-MPC-M	-1.0005	-1.0005	-1.0005	-1.0005	1.27568E-08
	CCMA	-1.0005	-1.0005	-1.0005	-1.0005	2.72025E-08
g04	GA-MPC	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
	GA-MPC-CC	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
	GA-MPC-DBmax	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
	GA-MPC-FDfar	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
	GA-MPC-M	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
	CCMA	-30665.53867	-30665.53867	-30665.53867	-30665.53867	0.0000E+00
g05	GA-MPC	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
	GA-MPC-CC	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
	GA-MPC-DBmax	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
	GA-MPC-FDfar	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
	GA-MPC-M	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
	CCMA	5126.496714	5126.496714	5126.496714	5126.496714	0.0000E+00
g06	GA-MPC	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
	GA-MPC-CC	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
	GA-MPC-DBmax	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
	GA-MPC-FDfar	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
	GA-MPC-M	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
	CCMA	-6961.81388	-6961.81388	-6961.81388	-6961.81388	0.00000E+00
g07	GA-MPC	24.30620953	24.30621127	24.30621161	24.30621390	1.26436E-06
	GA-MPC-CC	24.30620954	24.30621201	24.30621283	24.30621966	2.79833E-06
	GA-MPC-DBmax	24.30620961	24.30621165	24.30621174	24.30621434	1.59293E-06
	GA-MPC-FDfar	24.30620975	24.30621154	24.30621231	24.30621697	2.13967E-06
	GA-MPC-M	24.30620939	24.30621106	24.30621154	24.30621555	1.57312E-06
	CCMA	24.30620907	24.30620907	24.30620907	24.30620907	0.00000E+00
g08	GA-MPC	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
	GA-MPC-CC	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
	GA-MPC-DBmax	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
	GA-MPC-FDfar	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
	GA-MPC-M	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
	CCMA	-9.58250E-02	-9.58250E-02	-9.58250E-02	-9.58250E-02	0.00000E+00
g09	GA-MPC	680.63006	680.63006	680.63006	680.63006	0.00000E+00
	GA-MPC-CC	680.63006	680.63006	680.63006	680.63006	0.00000E+00
	GA-MPC-DBmax	680.63006	680.63006	680.63006	680.63006	0.00000E+00
	GA-MPC-FDfar	680.63006	680.63006	680.63006	680.63006	0.00000E+00
	GA-MPC-M	680.63006	680.63006	680.63006	680.63006	0.00000E+00
	CCMA	680.63006	680.63006	680.63006	680.63006	0.00000E+00
g10	GA-MPC	7049.24928008	7049.25959968	7049.26416535	7049.29075884	1.29483E-02
	GA-MPC-CC	7049.24910328	7049.25821185	7049.26026748	7049.27959852	9.47185E-03
	GA-MPC-DBmax	7049.24955536	7049.25946314	7049.26144468	7049.27870329	8.52288E-03
	GA-MPC-FDfar	7049.24850994	7049.25935465	7049.26729078	7049.30101401	1.79365E-02
	GA-MPC-M	7049.25053964	7049.25369624	7049.25524921	7049.27143189	4.97443E-03
	CCMA	7049.24802053	7049.24802053	7049.24802053	7049.24802053	0.00000E+00
g11	GA-MPC	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00

	GA-MPC-CC	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00
	GA-MPC-DBmax	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00
	GA-MPC-FDfar	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00
	GA-MPC-M	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00
	CCMA	0.74990000	0.74990000	0.74990000	0.74990000	0.00000E+00
g12	GA-MPC	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
	GA-MPC-CC	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
	GA-MPC-DBmax	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
	GA-MPC-FDfar	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
	GA-MPC-M	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
	CCMA	-1.00000000	-1.00000000	-1.00000000	-1.00000000	0.00000E+00
g13	GA-MPC	0.05394151	0.05394151	0.05394151	0.05394151	0.00000E+00
	GA-MPC-CC	0.05394151	0.05394151	0.05394151	0.05394151	0.00000E+00
	GA-MPC-DBmax	0.05394151	0.05394151	0.05394151	0.05394151	0.00000E+00
	GA-MPC-FDfar	0.05394151	0.05394151	0.05394151	0.05394151	0.00000E+00
	GA-MPC-M	0.05394151	0.05394151	0.05394151	0.05394151	0.00000E+00
	CCMA	0.05394151	0.05394151	0.06933596	0.43880261	7.69722E-02
g14	GA-MPC	-47.76488842	-47.76488724	-47.76488617	-47.76487688	2.88277E-06
	GA-MPC-CC	-47.76488846	-47.76488812	-47.76488765	-47.76488459	1.02996E-06
	GA-MPC-DBmax	-47.76488845	-47.76488821	-47.76488788	-47.76488564	7.32800E-07
	GA-MPC-FDfar	-47.76488844	-47.76488796	-47.76488776	-47.76488639	6.62993E-07
	GA-MPC-M	-47.76488846	-47.76488825	-47.76488793	-47.76488617	6.12267E-07
	CCMA	-47.76488843	-47.76488815	-47.76488777	-47.76488569	8.23285E-07
g15	GA-MPC	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
	GA-MPC-CC	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
	GA-MPC-DBmax	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
	GA-MPC-FDfar	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
	GA-MPC-M	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
	CCMA	961.71502229	961.71502229	961.71502229	961.71502229	0.00000E+00
g16	GA-MPC	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
	GA-MPC-CC	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
	GA-MPC-DBmax	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
	GA-MPC-FDfar	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
	GA-MPC-M	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
	CCMA	-1.90515526	-1.90515526	-1.90515526	-1.90515526	0.00000E+00
g17	GA-MPC	8853.53967481	8853.53967481	8877.23908306	8927.61907822	3.52599E+01
	GA-MPC-CC	8853.53967481	8853.53967481	8877.70600094	8939.29202524	3.60239E+01
	GA-MPC-DBmax	8853.53967481	8853.53967481	8877.23822580	8927.59764666	3.52586E+01
	GA-MPC-FDfar	8853.53967481	8853.53967481	8877.23822580	8927.59764666	3.52586E+01
	GA-MPC-M	8853.53967481	8853.53967481	8874.27590693	8927.59764666	3.39376E+01
	CCMA	8853.53967481	8853.53967481	8926.21143101	8953.51207841	3.39302E+01
g18	GA-MPC	-0.86602540	-0.86602540	-0.86602540	-0.86602540	1.49182E-09
	GA-MPC-CC	-0.86602540	-0.86602540	-0.86602540	-0.86602540	3.89544E-10
	GA-MPC-DBmax	-0.86602540	-0.86602540	-0.86602540	-0.86602540	9.93399E-10
	GA-MPC-FDfar	-0.86602540	-0.86602540	-0.86602540	-0.86602540	4.10498E-10
	GA-MPC-M	-0.86602540	-0.86602540	-0.86602540	-0.86602540	4.32336E-10
	CCMA	-0.86602540	-0.86602540	-0.86602540	-0.86602537	7.78912E-09
g19	GA-MPC	32.66134442	32.67656928	32.67805164	32.70499731	1.30111E-02
	GA-MPC-CC	32.66177147	32.67227861	32.67776960	32.72518441	1.64958E-02
	GA-MPC-DBmax	32.66172962	32.67997982	32.68404090	32.75148657	2.24724E-02
	GA-MPC-FDfar	32.66164194	32.66923846	32.67678561	32.71661918	1.62581E-02
	GA-MPC-M	32.66172962	32.67718779	32.67804872	32.70460742	1.35776E-02
	CCMA	32.65559295	32.65559295	32.65559295	32.65559295	0.00000E+00
g21	GA-MPC	193.72451041	193.72709354	240.91168600	324.70747644	6.06784E+01
	GA-MPC-CC	193.72451027	193.72464874	205.07760595	324.70286187	3.28077E+01
	GA-MPC-DBmax	193.72451015	193.72470573	201.31082447	317.43585675	2.75467E+01
	GA-MPC-FDfar	193.72451044	193.72460250	196.36188494	259.64889281	1.31848E+01
	GA-MPC-M	193.72451020	193.72451467	193.72456310	193.72510044	1.28655E-04
	CCMA	193.72451007	193.72451007	193.72451007	193.72451007	7.49080E-10
g23	GA-MPC	-400.03863640	-392.55097025	-389.02387569	-355.07978863	1.09141E+01
	GA-MPC-CC	-400.05442579	-398.40634983	-397.24278356	-387.38513200	3.33840E+00
	GA-MPC-DBmax	-400.05416806	-399.69420341	-398.82073793	-392.58490588	2.30745E+00
	GA-MPC-FDfar	-400.05483551	-399.76713191	-398.95897029	-391.22506430	2.18670E+00
	GA-MPC-M	-400.05451006	-399.74356039	-398.31403955	-384.03524751	3.85646E+00
	CCMA	-400.05509895	-400.05419995	-400.03013270	-399.68038208	7.56704E-02
	GA-MPC	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00

g24	GA-MPC-CC	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00
	GA-MPC-DBmax	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00
	GA-MPC-FDfar	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00
	GA-MPC-M	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00
	CCMA	-5.50801327	-5.50801327	-5.50801327	-5.50801327	0.00000E+00

Appendix B

Function values obtained by CCMA, SAMO-DE, ECHT-EP2, MDE, APF-GA, ATMES and SMES

P.	Criteria	CCMA	SAMO-DE	ECHT-EP2	MDE	APF-GA	ATMES	SMES
	FES	240,000	240,000	240,000	500,000	500,000	240,000	240,000
g01	best	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000
	Avg.	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000	-15.0000
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.6E-14	0.00E+00
g02	best	-0.8036191	-0.8036191	-0.8036191	-0.8036191	-0.803601	-0.803339	-0.803601
	Avg.	-0.79650714	-0.79873521	-0.7998220	-0.78616	-0.803518	-0.790148	-0.785238
	St. d	7.06481E-03	8.8005E-03	1.26E-02	1.26E-02	1.00E-04	1.3E-02	1.67E-02
g03	best	-1.0005	-1.0005	-1.0005	-1.0005	-1.001	-1.000	1.000
	Avg.	-1.0005	-1.0005	-1.0005	-1.0005	-1.001	-1.000	1.000
	St. d	2.72025E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.9E-05	2.09E-05
g04	best	-30665.539	-30665.5386	-30665.539	-30665.539	-30665.539	-30665.539	-30665.539
	Avg.	-30665.539	-30665.5386	-30665.539	-30665.539	-30665.539	-30665.539	-30665.539
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-04	7.4E-12	0.00E+00
g05	best	5126.497	5126.497	5126.497	5126.497	5126.497	5126.498	5126.599
	Avg.	5126.497	5126.497	5126.497	5126.497	5127.5423	5127.648	5174.492
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.4324 E+00	1.8E+00	5.006E+01
g06	best	-6961.813875	-6961.813875	-6961.814	-6961.814	-6961.814	-6961.814	-6961.814
	Avg.	-6961.813875	-6961.813875	-6961.814	-6961.814	-6961.814	-6961.814	-6961.284
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.6E-12	1.85E+00
g07	best	24.3062	24.3062	24.3062	24.3062	24.3062	24.306	24.327
	Avg.	24.3062	24.3096	24.3063	24.3062	24.3062	24.316	24.475
	St. d	0.00E+00	1.5888E-03	3.19E-05	0.00E+00	0.00E+00	1.1E-02	1.32E-01
g08	best	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825
	Avg.	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825	-0.095825
	St. d	0.00E+00	0.00E+00	2.61E-08	0.00E+00	0.00E+00	2.8E-17	0.00E+00
g09	best	680.630	680.630	680.630	680.630	680.630	680.630	680.632
	Avg.	680.630	680.630	680.630	680.630	680.630	680.639	680.643
	St. d	0.00E+00	1.1567E-05	0.00E+00	0.00E+00	0.00E+00	1.0E-02	1.55E-02
g10	best	7049.24802	7049.24802	7049.2483	7049.24802	7049.24802	7052.253	7051.903
	Avg.	7049.24802	7059.81345	7049.2490	7049.24802	7077.6821	7250.437	7253.047
	St. d	0.00E+00	7.856E+00	6.60E-04	0.00E+00	5.1240E+01	1.2E+02	1.36E+02
g11	best	0.7499	0.7499	0.7499	0.7499	0.7499	0.75	0.75
	Avg.	0.7499	0.7499	0.7499	0.7499	0.7499	0.75	0.75
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.4E-04	1.52E-04
g12	best	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000
	Avg.	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000	-1.0000
	St. d	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.0E-03	0.00E+00
g13	best	0.053942	0.053942	0.053942	0.053942	0.053942	0.053950	0.053986
	Avg.	0.069336	0.053942	0.053942	0.053942	0.053942	0.053959	0.166385
	St. d	7.69722E-02	1.7541E-08	1.00E-12	0.00E+00	0.00E+00	1.3E-05	1.77E-01
g14	best	-47.76489	-47.76489	-47.7649	-47.764887	-47.76479	-	-
	Avg.	-47.76489	-47.68115	-47.7648	-47.764874	-47.76479	-	-
	St. d	0.00E+00	4.043E-02	2.72E-05	1.400E-05	1.00E-04	-	-
g15	best	961.71502	961.71502	961.71502	961.71502	961.71502	-	-
	Avg.	961.71502	961.71502	961.71502	961.71502	961.71502	-	-
	St. d	0.00E+00	0.00E+00	2.01E-13	0.00E+00	0.00E+00	-	-
g16	best	-1.905155	-1.905155	-1.905155	-1.905155	-1.905155	-	-
	Avg.	-1.905155	-1.905155	-1.905155	-1.905155	-1.905155	-	-
	St. d	0.00E+00	0.00E+00	1.12E-10	0.00E+00	0.00E+00	-	-
g17	best	8853.53967	8853.53967	8853.53967	8853.53967	8853.5398	-	-
	Avg.	8926.21143	8853.53967	8853.53967	8853.53967	8888.4876	-	-
	St. d	3.39302E+01	1.1500E-05	2.13E-08	0.00E+00	29.0347	-	-
g18	best	-0.866025	-0.866025	-0.866025	-0.866025	-0.866025	-	-
	Avg.	-0.866025	-0.866024	-0.866025	-0.866025	-0.865925	-	-
	St. d	7.78912E-09	7.043672E-07	1.00E-09	0.00E+00	1.00E-04	-	-
g19	best	32.655593	32.655593	32.6591	32.655693	32.655593	-	-
	Avg.	32.655593	32.757340	32.6623	33.34125	32.655593	-	-
	St. d	0.00E+00	6.145E-02	3.4E-03	8.475E-01	0.00E+00	-	-
g21	best	193.72451	193.724510	193.7246	193.72451	196.63301	-	-

	Avg.	193.72451	193.771375	193.7438	193.72451	199.51581	-	-
	<i>St. d</i>	7.49080E-01	1.9643E-02	1.65E-02	0.00E+00	3.8656	-	-
g23	best	-400.055099	-396.165732	-398.9731	-400.0551	-399.7624	-	-
	Avg.	-400.030133	-360.817656	-373.2178	-400.0551	-394.7627	-	-
	<i>St. d</i>	7.56704E-02	1.9623E+01	3.37E+01	0.00E+00	3.8656E+00	-	-
g24	best	-5.508013	-5.508013	-5.508013	-5.508013	-5.508013	-	-
	Avg.	-5.508013	-5.508013	-5.508013	-5.508013	-5.508013	-	-
	<i>St. d</i>	0.00E+00	0.00E+00	1.8E-15	0.00E+00	0.00E+00	-	-

Appendix C

Function values obtained by CCMA and ϵ DEag for the CEC2010 test problems

Pro b.	Alg.	10D			30D		
		Best	Mean	<i>St. d</i>	Best	Mean	<i>St. d</i>
C01	CCMA	-7.473104E-01	-7.467701E-01	1.869859E-03	-8.218842E-01	-8.141462E-01	6.999374E-03
	ϵ DEag	-7.473104E-01	-7.470402E-01	1.323339E-03	-8.218255E-01	-8.208687E-01	7.103893E-04
C02	CCMA	-2.277710E+00	-2.277707E+00	2.517499E-06	-2.277471E+00	-2.270847E+00	5.973133E-03
	ϵ DEag	-2.277702E+00	-2.269502E+00	2.3897790E-02	-2.169248E+00	-2.151424E+00	1.197582E-02
C03	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	3.240477E-24	8.442296E-02	4.218478E-01
	ϵ DEag	0.000000E+00	0.000000E+00	0.000000E+00	2.867347E+01	2.883785E+01	8.047159E-01
C04	CCMA	-1.000000E-05	-1.000000E-05	0.000000E+00	-3.321029E-06	-3.235763E-06	8.985472E-08
	ϵ DEag	-9.992345E-06	-9.918452E-06	1.5467300E-07	4.698111E-03	8.162973E-03	3.067785E-03
C05	CCMA	-4.836106E+02	-4.836106E+02	7.046557E-09	-4.836106E+02	-4.836093E+02	2.447876E-03
	ϵ DEag	-4.836106E+02	-4.836106E+02	3.89035E-13	-4.531307E+02	-4.495460E+02	2.899105E+00
C06	CCMA	-5.786624E+02	-5.786602E+02	2.546542E-03	-5.306377E+02	-5.303425E+02	9.714491E-01
	ϵ DEag	-5.786581E+02	-5.786528E+02	3.6271690E-03	-5.285750E+02	-5.279068E+02	4.748378E-01
C07	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	7.431642E-26	2.832806E-21	1.306951E-20
	ϵ DEag	0.000000E+00	0.000000E+00	0.000000E+00	1.147112E-15	2.603632E-15	1.233430E-15
C08	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	3.210560E-25	4.595020E+00	1.709443E+01
	ϵ DEag	0.000000E+00	6.727528E+00	5.560648E+00	2.518693E-14	7.831464E-14	4.855177E-14
C09	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	5.615222E-25	3.196975E-06	1.577724E-05
	ϵ DEag	0.000000E+00	0.000000E+00	0.000000E+00	2.770665E-16	1.072140E+01	2.821923E+01
C10	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	3.493753E-26	9.758560E-01	2.925281E+00
	ϵ DEag	0.000000E+00	0.000000E+00	0.000000E+00	3.252002E+01	3.326175E+01	4.545577E-01
C11	CCMA	-1.52271E-03	-1.52271E-03	8.912164E-12	-3.923425E-04	-3.923363E-04	9.433135E-09
	ϵ DEag	-1.52271E-03	-1.52271E-03	6.3410350E-11	-3.268462E-04	-2.863882E-04	2.707605E-05
C12	CCMA	-3.054888E+02	-6.118898E+01	1.244952E+02	-1.992635E-01	-1.992633E-01	2.446028E-07
	ϵ DEag	-5.700899E+02	-3.367349E+02	1.7821660E+02	-1.991453E-01	3.562330E+02	2.889253E+02
C13	CCMA	-6.842937E+01	-6.692766E+01	1.837361E+00	-6.842931E+01	-6.202288E+01	3.895266E+00
	ϵ DEag	-6.842937E+01	-6.842936E+01	1.0259600E-06	-6.642473E+01	-6.535310E+01	5.733005E-01
C14	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	7.770359E-26	8.655464E-20	2.581885E-19
	ϵ DEag	0.000000E+00	0.000000E+00	0.000000E+00	5.015863E-14	3.089407E-13	5.608409E-13
C15	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	5.279373E-26	9.508252E-16	4.735074E-15
	ϵ DEag	0.000000E+00	1.798980E-01	8.8131560E-01	2.160345E+01	2.160376E+01	1.104834E-04
C16	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00	0.000000E+00
	ϵ DEag	0.000000E+00	3.702054E-01	3.7104790E-01	0.000000E+00	2.168404E-21	1.062297E-20
C17	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	2.226623E-10	1.328045E-01	1.728278E-01
	ϵ DEag	1.463180E-17	1.249561E-01	1.9371970E-01	2.165719E-01	6.326487E+00	4.986691E+00
C18	CCMA	0.000000E+00	0.000000E+00	0.000000E+00	2.214269E-07	5.406446E-01	1.793574E+00
	ϵ DEag	3.731440E-20	9.678765E-19	1.8112340E-18	1.226054E+00	8.754569E+01	1.664753E+02