

## Simulation Log

The following table represent a list of all simulation runs conducted at the Community Coordinated Modeling Center (CCMC) using the BATS-R-US plus RCM global magnetosphere model. The columns in the table represent from left to right: (1) The run number assigned in this study; (2) the run name as assigned at the CCMC; (3)-(8) solar wind electric field,  $E_{yz}$ , ram pressure,  $p_{ram}$ , and Mach number,  $M_A$ , and Temperature,  $T_p$  [eV], IMF magnitude,  $B_t$ , and IMF clock angle parameter space established as described in Section 3; (9)-(13) the native simulation variables, namely the proton density,  $n_p$ , and temperature,  $T_p$  [K], GSM X-component of the solar wind speed,  $v_x$ , and the GSM Y and Z components of the IMF,  $B_y$  and  $B_z$ .

Run#	CMMC Run Name	Eyz [mV/m]	pram [nPa]	MA	Tp [eV]	B t [nT]	Clock [deg.]	Np [cm^-3]	Tp [K]	Vx [km/s]	By [nT]	Bz [nT]
9	Haje_Korth_073007_1	1.00	1.74	6.54	10.00	7.15	0.0	53.18	116040.00	-139.86	0.00	7.15
10	Haje_Korth_073007_2	1.00	1.74	6.54	10.00	7.15	90.0	53.18	116040.00	-139.86	7.15	0.00
11	Haje_Korth_073007_3	1.00	1.74	6.54	10.00	7.15	180.0	53.18	116040.00	-139.86	0.00	-7.15
12	Haje_Korth_073007_4	1.00	1.74	6.54	10.00	7.15	270.0	53.18	116040.00	-139.86	-7.15	0.00
13	Haje_Korth_073107_1	1.00	1.74	6.54	10.00	7.15	45.0	53.18	116040.00	-139.86	5.06	5.06
14	Haje_Korth_073107_2	1.00	1.74	6.54	10.00	7.15	135.0	53.18	116040.00	-139.86	5.06	-5.06
15	Haje_Korth_073107_3	1.00	1.74	6.54	10.00	7.15	225.0	53.18	116040.00	-139.86	-5.06	-5.06
16	Haje_Korth_073107_4	1.00	1.74	6.54	10.00	7.15	315.0	53.18	116040.00	-139.86	-5.06	5.06
17	Haje_Korth_080107_1	2.00	1.74	6.54	10.00	7.15	0.0	13.30	116040.00	-279.72	0.00	7.15
18	Haje_Korth_080107_2	2.00	1.74	6.54	10.00	7.15	90.0	13.30	116040.00	-279.72	7.15	0.00
19	Haje_Korth_080107_3	2.00	1.74	6.54	10.00	7.15	180.0	13.30	116040.00	-279.72	0.00	-7.15
20	Haje_Korth_080107_4	2.00	1.74	6.54	10.00	7.15	270.0	13.30	116040.00	-279.72	-7.15	0.00
21	Haje_Korth_080207_1	2.00	1.74	6.54	10.00	7.15	45.0	13.30	116040.00	-279.72	5.06	5.06
22	Haje_Korth_080207_2	2.00	1.74	6.54	10.00	7.15	135.0	13.30	116040.00	-279.72	5.06	-5.06
23	Haje_Korth_080207_3	2.00	1.74	6.54	10.00	7.15	225.0	13.30	116040.00	-279.72	-5.06	-5.06
24	Haje_Korth_080207_4	2.00	1.74	6.54	10.00	7.15	315.0	13.30	116040.00	-279.72	-5.06	5.06
33	Haje_Korth_081407_1	3.00	1.74	6.54	10.00	7.15	0.0	5.91	116040.00	-419.58	0.00	7.15
34	Haje_Korth_081407_2	3.00	1.74	6.54	10.00	7.15	90.0	5.91	116040.00	-419.58	7.15	0.00
35	Haje_Korth_081407_3	3.00	1.74	6.54	10.00	7.15	180.0	5.91	116040.00	-419.58	0.00	-7.15
36	Haje_Korth_081407_4	3.00	1.74	6.54	10.00	7.15	270.0	5.91	116040.00	-419.58	-7.15	0.00
37	Haje_Korth_081607_1	3.00	1.74	6.54	10.00	7.15	45.0	5.91	116040.00	-419.58	5.06	5.06
38	Haje_Korth_081607_2	3.00	1.74	6.54	10.00	7.15	135.0	5.91	116040.00	-419.58	5.06	-5.06
39	Haje_Korth_081607_3	3.00	1.74	6.54	10.00	7.15	225.0	5.91	116040.00	-419.58	-5.06	-5.06
40	Haje_Korth_081607_4	3.00	1.74	6.54	10.00	7.15	315.0	5.91	116040.00	-419.58	-5.06	5.06
41	Haje_Korth_081707_1	4.00	1.74	6.54	10.00	7.15	0.0	3.32	116040.00	-559.45	0.00	7.15
42	Haje_Korth_081707_2	4.00	1.74	6.54	10.00	7.15	90.0	3.32	116040.00	-559.45	7.15	0.00
43	Haje_Korth_081707_3	4.00	1.74	6.54	10.00	7.15	180.0	3.32	116040.00	-559.45	0.00	-7.15
44	Haje_Korth_081707_4	4.00	1.74	6.54	10.00	7.15	270.0	3.32	116040.00	-559.45	-7.15	0.00
45	Haje_Korth_082007_1	4.00	1.74	6.54	10.00	7.15	45.0	3.32	116040.00	-559.45	5.06	5.06
46	Haje_Korth_082007_2	4.00	1.74	6.54	10.00	7.15	135.0	3.32	116040.00	-559.45	5.06	-5.06
47	Haje_Korth_082007_3	4.00	1.74	6.54	10.00	7.15	225.0	3.32	116040.00	-559.45	-5.06	-5.06
48	Haje_Korth_082007_4	4.00	1.74	6.54	10.00	7.15	315.0	3.32	116040.00	-559.45	-5.06	5.06
65	Haje_Korth_052008_1	2.79	1.00	6.54	10.00	5.42	0.0	2.26	116040.00	-514.73	0.00	5.42
66	Haje_Korth_052008_2	2.79	1.00	6.54	10.00	5.42	90.0	2.26	116040.00	-514.73	5.42	0.00
67	Haje_Korth_052008_3	2.79	1.00	6.54	10.00	5.42	180.0	2.26	116040.00	-514.73	0.00	-5.42
68	Haje_Korth_052008_4	2.79	1.00	6.54	10.00	5.42	270.0	2.26	116040.00	-514.73	-5.42	0.00
69	Haje_Korth_052108_1	2.79	1.00	6.54	10.00	5.42	45.0	2.26	116040.00	-514.73	3.83	3.83
70	Haje_Korth_052108_2	2.79	1.00	6.54	10.00	5.42	135.0	2.26	116040.00	-514.73	3.83	-3.83
71	Haje_Korth_052108_3	2.79	1.00	6.54	10.00	5.42	225.0	2.26	116040.00	-514.73	-3.83	-3.83
72	Haje_Korth_052108_4	2.79	1.00	6.54	10.00	5.42	315.0	2.26	116040.00	-514.73	-3.83	3.83
145	Haje_Korth_061908_1	2.79	2.00	6.54	10.00	7.67	0.0	9.03	116040.00	-363.97	0.00	7.67
146	Haje_Korth_061908_2	2.79	2.00	6.54	10.00	7.67	90.0	9.03	116040.00	-363.97	7.67	0.00
147	Haje_Korth_061908_3	2.79	2.00	6.54	10.00	7.67	180.0	9.03	116040.00	-363.97	0.00	-7.67
148	Haje_Korth_061908_4	2.79	2.00	6.54	10.00	7.67	270.0	9.03	116040.00	-363.97	-7.67	0.00
149	Haje_Korth_062008_1	2.79	2.00	6.54	10.00	7.67	45.0	9.03	116040.00	-363.97	5.42	5.42
150	Haje_Korth_062008_2	2.79	2.00	6.54	10.00	7.67	135.0	9.03	116040.00	-363.97	5.42	-5.42
151	Haje_Korth_062008_3	2.79	2.00	6.54	10.00	7.67	225.0	9.03	116040.00	-363.97	-5.42	-5.42
152	Haje_Korth_062008_4	2.79	2.00	6.54	10.00	7.67	315.0	9.03	116040.00	-363.97	-5.42	5.42
73	Haje_Korth_052208_1	2.79	3.00	6.54	10.00	9.39	0.0	20.31	116040.00	-297.18	0.00	9.39
74	Haje_Korth_052208_2	2.79	3.00	6.54	10.00	9.39	90.0	20.31	116040.00	-297.18	9.39	0.00
75	Haje_Korth_052208_3	2.79	3.00	6.54	10.00	9.39	180.0	20.31	116040.00	-297.18	0.00	-9.39
76	Haje_Korth_052208_4	2.79	3.00	6.54	10.00	9.39	270.0	20.31	116040.00	-297.18	-9.39	0.00
77	Haje_Korth_052308_1	2.79	3.00	6.54	10.00	9.39	45.0	20.31	116040.00	-297.18	6.64	6.64
78	Haje_Korth_052308_2	2.79	3.00	6.54	10.00	9.39	135.0	20.31	116040.00	-297.18	6.64	-6.64
79	Haje_Korth_052308_3	2.79	3.00	6.54	10.00	9.39	225.0	20.31	116040.00	-297.18	-6.64	-6.64
80	Haje_Korth_052308_4	2.79	3.00	6.54	10.00	9.39	315.0	20.31	116040.00	-297.18	-6.64	6.64
153	Haje_Korth_070108_1	2.79	4.00	6.54	10.00	10.84	0.0	36.11	116040.00	-257.36	0.00	10.84
154	Haje_Korth_070108_2	2.79	4.00	6.54	10.00	10.84	90.0	36.11	116040.00	-257.36	10.84	0.00
155	Haje_Korth_070108_3	2.79	4.00	6.54	10.00	10.84	180.0	36.11	116040.00	-257.36	0.00	-10.84
156	Haje_Korth_070108_4	2.79	4.00	6.54	10.00	10.84	270.0	36.11	116040.00	-257.36	-10.84	0.00
157	Haje_Korth_070208_1	2.79	4.00	6.54	10.00	10.84	45.0	36.11	116040.00	-257.36	7.67	7.67
158	Haje_Korth_070208_2	2.79	4.00	6.54	10.00	10.84	135.0	36.11	116040.00	-257.36	7.67	-7.67
159	Haje_Korth_070208_3	2.79	4.00	6.54	10.00	10.84	225.0	36.11	116040.00	-257.36	-7.67	-7.67
160	Haje_Korth_070208_4	2.79	4.00	6.54	10.00	10.84	315.0	36.11	116040.00	-257.36	-7.67	7.67

81	Haje_Korth_052508_1	2.79	5.00	6.54	10.00	12.12	0.0	56.41	116040.00	-230.19	0.00	12.12
82	Haje_Korth_052508_2	2.79	5.00	6.54	10.00	12.12	90.0	56.41	116040.00	-230.19	12.12	0.00
83	Haje_Korth_052508_3	2.79	5.00	6.54	10.00	12.12	180.0	56.41	116040.00	-230.19	0.00	-12.12
84	Haje_Korth_052508_4	2.79	5.00	6.54	10.00	12.12	270.0	56.41	116040.00	-230.19	-12.12	0.00
85	Haje_Korth_052708_1	2.79	5.00	6.54	10.00	12.12	45.0	56.41	116040.00	-230.19	8.57	8.57
86	Haje_Korth_052708_2	2.79	5.00	6.54	10.00	12.12	135.0	56.41	116040.00	-230.19	8.57	-8.57
87	Haje_Korth_052708_3	2.79	5.00	6.54	10.00	12.12	225.0	56.41	116040.00	-230.19	-8.57	-8.57
88	Haje_Korth_052708_4	2.79	5.00	6.54	10.00	12.12	315.0	56.41	116040.00	-230.19	-8.57	8.57
89	Haje_Korth_052908_1	2.79	1.74	2.00	10.00	23.38	0.0	73.05	116040.00	-119.33	0.00	23.38
90	Haje_Korth_052908_2	2.79	1.74	2.00	10.00	23.38	90.0	73.05	116040.00	-119.33	23.38	0.00
91	Haje_Korth_052908_3	2.79	1.74	2.00	10.00	23.38	180.0	73.05	116040.00	-119.33	0.00	-23.38
92	Haje_Korth_052908_4	2.79	1.74	2.00	10.00	23.38	270.0	73.05	116040.00	-119.33	-23.38	0.00
93	Haje_Korth_053008_1	2.79	1.74	2.00	10.00	23.38	45.0	73.05	116040.00	-119.33	16.53	16.53
94	Haje_Korth_053008_2	2.79	1.74	2.00	10.00	23.38	135.0	73.05	116040.00	-119.33	16.53	-16.53
95	Haje_Korth_053008_3	2.79	1.74	2.00	10.00	23.38	225.0	73.05	116040.00	-119.33	-16.53	-16.53
96	Haje_Korth_053008_4	2.79	1.74	2.00	10.00	23.38	315.0	73.05	116040.00	-119.33	-16.53	16.53
97	Haje_Korth_060208_1	2.79	1.74	4.00	10.00	11.69	0.0	18.26	116040.00	-238.66	0.00	11.69
98	Haje_Korth_060208_2	2.79	1.74	4.00	10.00	11.69	90.0	18.26	116040.00	-238.66	11.69	0.00
99	Haje_Korth_060208_3	2.79	1.74	4.00	10.00	11.69	180.0	18.26	116040.00	-238.66	0.00	-11.69
100	Haje_Korth_060208_4	2.79	1.74	4.00	10.00	11.69	270.0	18.26	116040.00	-238.66	-11.69	0.00
101	Haje_Korth_060308_1	2.79	1.74	4.00	10.00	11.69	45.0	18.26	116040.00	-238.66	8.27	8.27
102	Haje_Korth_060308_2	2.79	1.74	4.00	10.00	11.69	135.0	18.26	116040.00	-238.66	8.27	-8.27
103	Haje_Korth_060308_3	2.79	1.74	4.00	10.00	11.69	225.0	18.26	116040.00	-238.66	-8.27	-8.27
104	Haje_Korth_060308_4	2.79	1.74	4.00	10.00	11.69	315.0	18.26	116040.00	-238.66	-8.27	8.27
105	Haje_Korth_060408_1	2.79	1.74	6.00	10.00	7.79	0.0	8.12	116040.00	-357.99	0.00	7.79
106	Haje_Korth_060408_2	2.79	1.74	6.00	10.00	7.79	90.0	8.12	116040.00	-357.99	7.79	0.00
107	Haje_Korth_060408_3	2.79	1.74	6.00	10.00	7.79	180.0	8.12	116040.00	-357.99	0.00	-7.79
108	Haje_Korth_060408_4	2.79	1.74	6.00	10.00	7.79	270.0	8.12	116040.00	-357.99	-7.79	0.00
109	Haje_Korth_060508_1	2.79	1.74	6.00	10.00	7.79	45.0	8.12	116040.00	-357.99	5.51	5.51
110	Haje_Korth_060508_2	2.79	1.74	6.00	10.00	7.79	135.0	8.12	116040.00	-357.99	5.51	-5.51
111	Haje_Korth_060508_3	2.79	1.74	6.00	10.00	7.79	225.0	8.12	116040.00	-357.99	-5.51	-5.51
112	Haje_Korth_060508_4	2.79	1.74	6.00	10.00	7.79	315.0	8.12	116040.00	-357.99	-5.51	5.51
113	Haje_Korth_060608_1	2.79	1.74	8.00	10.00	5.85	0.0	4.57	116040.00	-477.33	0.00	5.85
114	Haje_Korth_060608_2	2.79	1.74	8.00	10.00	5.85	90.0	4.57	116040.00	-477.33	5.85	0.00
115	Haje_Korth_060608_3	2.79	1.74	8.00	10.00	5.85	180.0	4.57	116040.00	-477.33	0.00	-5.85
116	Haje_Korth_060608_4	2.79	1.74	8.00	10.00	5.85	270.0	4.57	116040.00	-477.33	-5.85	0.00
117	Haje_Korth_060908_1	2.79	1.74	8.00	10.00	5.85	45.0	4.57	116040.00	-477.33	4.13	4.13
118	Haje_Korth_060908_2	2.79	1.74	8.00	10.00	5.85	135.0	4.57	116040.00	-477.33	4.13	-4.13
119	Haje_Korth_060908_3	2.79	1.74	8.00	10.00	5.85	225.0	4.57	116040.00	-477.33	-4.13	-4.13
120	Haje_Korth_060908_4	2.79	1.74	8.00	10.00	5.85	315.0	4.57	116040.00	-477.33	-4.13	4.13
121	Haje_Korth_061008_1	2.79	1.74	10.00	10.00	4.68	0.0	2.92	116040.00	-596.66	0.00	4.68
122	Haje_Korth_061008_2	2.79	1.74	10.00	10.00	4.68	90.0	2.92	116040.00	-596.66	4.68	0.00
123	Haje_Korth_061008_3	2.79	1.74	10.00	10.00	4.68	180.0	2.92	116040.00	-596.66	0.00	-4.68
124	Haje_Korth_061008_4	2.79	1.74	10.00	10.00	4.68	270.0	2.92	116040.00	-596.66	-4.68	0.00
125	Haje_Korth_061108_1	2.79	1.74	10.00	10.00	4.68	45.0	2.92	116040.00	-596.66	3.31	3.31
126	Haje_Korth_061108_2	2.79	1.74	10.00	10.00	4.68	135.0	2.92	116040.00	-596.66	3.31	-3.31
127	Haje_Korth_061108_3	2.79	1.74	10.00	10.00	4.68	225.0	2.92	116040.00	-596.66	-3.31	-3.31
128	Haje_Korth_061108_4	2.79	1.74	10.00	10.00	4.68	315.0	2.92	116040.00	-596.66	-3.31	3.31
129	Haje_Korth_061208_1	2.79	1.74	12.00	10.00	3.90	0.0	2.03	116040.00	-715.99	0.00	3.90
130	Haje_Korth_061208_2	2.79	1.74	12.00	10.00	3.90	90.0	2.03	116040.00	-715.99	3.90	0.00
131	Haje_Korth_061208_3	2.79	1.74	12.00	10.00	3.90	180.0	2.03	116040.00	-715.99	0.00	-3.90
132	Haje_Korth_061208_4	2.79	1.74	12.00	10.00	3.90	270.0	2.03	116040.00	-715.99	-3.90	0.00
133	Haje_Korth_061308_1	2.79	1.74	12.00	10.00	3.90	45.0	2.03	116040.00	-715.99	2.76	2.76
134	Haje_Korth_061308_2	2.79	1.74	12.00	10.00	3.90	135.0	2.03	116040.00	-715.99	2.76	-2.76
135	Haje_Korth_061308_3	2.79	1.74	12.00	10.00	3.90	225.0	2.03	116040.00	-715.99	-2.76	-2.76
136	Haje_Korth_061308_4	2.79	1.74	12.00	10.00	3.90	315.0	2.03	116040.00	-715.99	-2.76	2.76
137	Haje_Korth_061608_1	2.79	1.74	14.00	10.00	3.34	0.0	1.49	116040.00	-835.32	0.00	3.34
138	Haje_Korth_061608_2	2.79	1.74	14.00	10.00	3.34	90.0	1.49	116040.00	-835.32	3.34	0.00
139	Haje_Korth_061608_3	2.79	1.74	14.00	10.00	3.34	180.0	1.49	116040.00	-835.32	0.00	-3.34
140	Haje_Korth_061608_4	2.79	1.74	14.00	10.00	3.34	270.0	1.49	116040.00	-835.32	-3.34	0.00
141	Haje_Korth_061708_1	2.79	1.74	14.00	10.00	3.34	45.0	1.49	116040.00	-835.32	2.36	2.36
142	Haje_Korth_061708_2	2.79	1.74	14.00	10.00	3.34	135.0	1.49	116040.00	-835.32	2.36	-2.36
143	Haje_Korth_061708_3	2.79	1.74	14.00	10.00	3.34	225.0	1.49	116040.00	-835.32	-2.36	-2.36
144	Haje_Korth_061708_4	2.79	1.74	14.00	10.00	3.34	315.0	1.49	116040.00	-835.32	-2.36	2.36