Solar and Interplanetary Sources of the 78 Major Geomagnetic Storms during 1996–2004

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ID[a]	Dst (min)		S-IP[b]	CME			Flare	Source[d]	Source[e]	IP Solar Wind[f]	Shock[g]	ICME		CL[h]	FN[i]
	Time (UT)	Int. (nT)	Driver (Type)	Time[c] (UT)	Vel km/s	AW (d)	Class	Region (Type)	Coord.	Structure (Type)	Time (UT)	Start (UT)	End UT		
1	1996/10/23 05	-105	C	10/20 07:03(CH)	..	..	..	CH	S10	**CIR**	..	..	..	1	
2	1997/04/22 00	-107	S	04/16 07:35	87	113	NO	UNK	UNK	**MC**	04/21 06	04/21 10	04/23 04	3	F
3	1997/05/15 13	-115	S	05/12 05:30	464	360	C1.3	AR8038	N21W08	SH+**MC**	05/15 01:15(W)	05/15 09	05/16 00	1	
4	1997/10/11 04	-130	S	10/06 15:28	293	174	NO	QS	S27W05	SH+**MC**	10/10 15:57(W)	10/10 22	10/12 00	1	F
5	1997/11/07 05	-110	S	11/04 06:10	785	360	X2.1	AR8100	S14W33	**SH**+MC	11/06 22:02(A)	11/07 04	11/08 10	1	
6	1997/11/23 07	-108	S	11/19 17:00(F)	..	..	C1.6	AR8108	N20E05	SH+**MC**	11/22 09:12(W)	11/22 18	11/23 14	2	F
7	1998/02/18 01	-100	S	02/12 15:55	63	126	No	UNK	UNK	**MC**	02/17 04	02/17 10	02/17 21	3	F
8	1998/03/10 21	-116	C	03/08 09:03(CH)	..	..	NO	CH	S30	**CIR**	..	..	..	1	
9	1998/05/04 06	-205	M	05/02 14:06	938	360	X1.1	AR8210	S15W15	**PICME-SH**	05/04 02:15(A)	..	..	2	F
			..	05/02 05:31	542	360	C5.4	AR8210	S19W09	..	..	..	..	..	
			..	05/01 23:40	585	360	M1.2	AR8210	S18W04	..	..	..	..	..	
			..	04/29 16:59	1374	360	M6.8	AR8210	S18E20	..	05/01 21:21(W)	05/02 05	05/04 02	..	
10	1998/06/26 05	-101	M	06/22 07:34	289	119	NO	QS	S58W05	**MC**	06/25 15:43(A)	06/25 23	06/26 19	2	F
			..	06/21 05:35	192	163	NO	AR8243	N15W30	..	06/24 10	06/24 16	06/25 23	..	
11	1998/08/06 12	-138	M	DG	..	..	NO	DG	DG	**PICME-SH**	08/06 07:16(W)	08/05 13	08/06 12	3	F
12	1998/08/07 06	-108	C	DG	..	..	NO	CH	DG	**CIR**	..	..	..	2	F
13	1998/08/27 10	-155	S	08/24 21:50(F)	..	..	X1.0	AR8307	N35E09	SH+**ICME**	08/26 06:40(W)	08/26 22	08/28 00	1	F
14	1998/09/25 10	-207	S	09/23 06:40(F)	..	..	M7.1	AR8340	N18E09	SH+**MC**	09/24 23:20(W)	09/25 02	09/26 16	1	F
15	1998/10/19 16	-112	S	10/15 10:04	362	360	NO	QS	N10E10	SH+**MC**	10/18 19:00(A)	10/19 04	10/20 07	1	F
16	1998/11/08 07	-149	M	11/04 07:54	523	360	C5.2	AR8375	N17E01	SH+ICME+**PICME-SH**	11/07 07:36(A)	11/07 22	11/09 03	2	F
			..	11/05 20:44	1119	360	M8.4	AR8375	N22W18	..	11/08 04:41(W)	..	..	..	
17	1998/11/09 18	-142	S	11/05 20:44	1119	360	M8.4	AR8375	N22W18	**MC**	11/08 04:41(W)	11/09 04	11/10 06	1	
18	1998/11/13 22	-131	S	11/09 18:17	325	190	NO	QS	N18E00	**MC**	11/13 01:43 (SC)	11/13 04	11/14 12	1	F
19	1999/01/14 00	-112	S	DG	..	..	NO	DG	DG	SH+**ICME**	01/13 10:47(W)	01/13 15	01/13 23	3	F
20	1999/02/18 10	-124	S	02/16 02:49(F)	..	..	M3.2	AR8458	S23W14	**SH**+ MC	02/18 02:48(W)	02/18 10	02/19 11	2	F
21	1999/09/23 00	-173	S	09/20 06:06	604	360	C2.8	QS	S21W05	**ICME**	09/22 12:09(W)	09/22 19	09/24 02	1	
22	1999/10/22 07	-237	S	10/18 00:06	144	240	No	QS	S26E08	**ICME - CIR**	10/21 02:20(W)	10/21 08	10/22 07	1	
23	1999/11/13 23	-106	M	DG	..	..	..	DG	DG	ICME+**PICME-SH**	11/13 12:48(W)	11/12 10	11/13 18	3	F
24	2000/02/12 12	-133	S	02/10 02:30	944	360	C7.3	AR8858	N22E03	SH+**ICME**	02/11 23:34(W)	02/12 09	02/13 00	1	
25	2000/04/07 01	-288	S	04/04 16:32	1188	360	C9.7	AR8933	N16W66	**SH**+ICME	04/06 16:32(W)	04/07 04	04/08 06	1	
26	2000/05/24 09	-147	M	05/20 06:26	557	..	C7.6	AR8998	S15W08	**ICME- ICME**	05/22 17	05/23 09	05/23 21	2	F
			..	05/22 01:50	649	360	C6.3	AR9004	N20W22	..	05/23 23:42(W)	05/24 12	05/26 18	..	
27	2000/07/16 01	-301	S	07/14 10:54	1674	360	X5.7	AR9077	N22W07	SH+**MC**	07/15 14:15(W)	07/15 19	07/17 08	1	
28	2000/08/11 07	-106	S	08/06 23:06	281	133	NO	UNK	UNK	SH+**MC**	..	08/10 19	08/12 01	3	F
29	2000/08/12 10	-235	S	08/09 16:30	702	360	C2.3	AR9114	N11W11	SH+**MC**	08/11 18:49(W)	08/12 05	08/13 22	1	
30	2000/09/18 00	-201	M	09/16 05:18	1215	360	M5.9	AR9165	N14W07	**SH(M)**+ICME(M)	09/17 15	09/17 21	09/21 12	2	
			..	09/15 21:50	285	360	C7.4	AR9165	N12E04	..	..	..	..	..	
			..	09/15 15:26	481	217	M2.0	AR9165	N12E07	..	..	..	..	..	
			..	09/15 12:06	633	235	C9.5	AR9165	N13E08	..	..	..	..	..	
31	2000/10/05 14	-182	M	09/29 21:50	173	274	NO	UNK	UNK	MC+PMC-SH+**ICME**	10/03 01:02(W)	10/03 10	10/05 06	2	F
			..	10/01 17:50	586	136	C5.0	QS	S27E33	..	10/05 03:28(W)	10/05 13	10/07 11	..	
32	2000/10/14 15	-107	S	10/09 23:50	798	360	C6.7	AR9182	N01W14	SH+**MC**	10/12 22:33(W)	10/13 12	10/14 20	1	
33	2000/10/29 04	-127	S	10/25 08:26	770	360	C4.0	QS	N06W60	SH+**MC**	10/28 09:30(W)	10/28 21	10/29 22	1	F
34	2000/11/06 22	-159	S	11/03 18:26	291	360	NO	UNK	UNK	**SH**+MC	11/06 09:30 (W)	11/06 22	11/07 17	3	F
35	2000/11/29 14	-119	M	11/26 17:06	980	360	X4.0	AR9236	N18W38	**ICME(M)**	11/28 05:25 (W)	11/28 16	11/29 22	2	F
			..	11/25 19:31	671	360	X1.9	AR9236	N20W23	..	..	..	..	..	
36	2001/03/20 14	-149	S	03/16 03:50	271	281	NO	UNK	UNK	SH+**MC**	03/19 11:33(W)	03/19 17	03/22 06	3	F

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ID[a]	Dst (min)		S-IP[b]	CME			Flare	Source[d]	Source[e]	IP Solar Wind[f]	Shock[g]	ICME		CL[h]	FN[i]
	Time (UT)	Int. (nT)	Driver (Type)	Time[c] (UT)	Vel km/s	AW (d)	Class	Region (Type)	Coord.	Structure (Type)	Time (UT)	Start (UT)	End UT		
37	2001/03/31 09	-387	M	03/29 10:26	942	360	X1.7	AR9393	N20W19	**SH(M)+ICME(M)**	03/31 01:14(W)	03/31 05	04/03 15	2	
			..	03/28 12:50	519	360	M4.3	AR9393	N16E03	..	..	..	..	..	
38	2001/04/12 00	-271	M	04/10 05:30	2411	360	X2.3	AR9415	S23W09	**SH(M)**+MC(M)	..	04/11 22	04/13 07	2	
			..	04/09 15:54	1192	360	M7.9	AR9415	S21W04	..	..	..	..	..	
39	2001/04/18 07	-114	S	04/15 14:06	1199	167	X14.4	AR9415	S20W85	**SH**+MC	04/18 00:49(W)	04/18 12	04/20 11	1	F
40	2001/04/22 16	-102	S	UNK	..	..	NO	UNK	UNK	**MC**	04/21 15:29(W)	04/21 23	04/23 08	3	F
41	2001/08/17 22	-105	S	08/14 16:01	618	360	C2.3	AR9577	N16W36	**SH**+MC	08/17 11:01(W)	08/17 20	08/19 16	1	
42	2001/09/26 02	-102	S	09/24 10:30	2402	360	X2.6	AR9632	S16E23	**SH**+ICME	09/25 20:17(W)	..	..	1	
43	2001/10/01 09	-148	S	09/28 08:54	846	360	M3.3	AR9636	N08E19	**SH**+ICME	09/30 19:14(W)	10/01 08	10/02 00	1	
44	2001/10/03 15	-166	S	09/29 11:54	509	216	M1.8	AR9636	N13E03	**MC**	10/01 22	10/02 04	10/03 17	1	
45	2001/10/21 22	-187	S	10/19 16:50	901	360	X1.6	AR9661	N15W29	**SH**+ICME	10/21 16:40(W)	10/21 20	10/25 10	1	
46	2001/10/28 12	-157	M	10/25 15:26	1092	360	X1.3	AR9672	S18W19	**PICME-SH**	10/28 03:13(W)	..	..	2	
			..	10/24 06:26	597	145	C2.6	AR9675	S13E27	..	10/26 22	10/27 03	10/28 20?	..	
47	2001/11/06 07	-292	M	11/04 16:35	1810	360	X1.0	AR9684	N06W18	MC+**PMC-SH**+ICME	11/06 01:25(A)	11/06 13	11/09 06	2	F
			..	11/03 19:20	457	360	NO	DG	DG	..	11/05 10	11/05 19	11/06 06	..	
48	2001/11/24 17	-221	M	11/22 23:30	1437	360	M9.9	AR9704	S14W36	**SH(M)**+ICME	11/24 04:54(W)	11/24 14	11/26 00	2	
			..	11/22 20:30	1443	360	M3.8	AR9698	S25W67	..	11/24 05:51(W)	..	..	..	
49	2002/03/24 10	-100	M	03/19 11:54	860	180	M1.0	AR9866	S10W58	**SH(M)+ICME(M)**	03/23 11:24(W)	03/23 21	03/25 20	2	
			..	03/20 17:54	603	180	NO	AR9871	S21W15	..	..	..	..	..	
50	2002/04/18 08	-127	S	04/15 03:50	720	360	M1.2	AR9906	S15W01	SH+**MC**	04/17 11:01(W)	04/17 16	04/19 15	1	
51	2002/04/20 09	-149	S	04/17 08:26	1240	360	M2.6	AR9906	S14W34	SH+**MC**	04/19 08:25(W)	04/20 00	04/21 18	1	F
52	2002/05/11 20	-110	S	05/08 13:50	614	360	C4.2	AR9934	S12W07	**SH**+ICME	05/11 11:30	05/11 16	05/12 00	1	
53	2002/05/23 18	-109	M	05/22 00:06	1246	186	C9.7	AR9948	S25W64	**SH(M)**	05/23 10:44(W)	05/23 20	05/25 18	2	
			..	05/22 03:50	1557	360	C5.0	QS	S22W53	..	..	..	..	..	
54	2002/08/02 06	-102	M	07/29 12:07	562	154	NO	QS	N34W36	ICME+**PICME-SH**+MC	08/01 04:24(A)	08/01 09	08/02 00	3	F
			..	07/29 23:30	360	130	NO	UNK	UNK	..	08/01 23:09(W)	08/02 04	08/04 02	..	F
55	2002/08/21 07	-106	S	08/16 12:30	1585	360	M5.2	AR0069	S14E20	SH+**MC**	08/20 13	08/20 15	08/21 14	2	F
56	2002/09/04 06	-109	C	08/31 06:48(CH)	..	..	..	CH	S15	**CIR**	..	..	..	1	F
57	2002/09/08 01	-181	M	09/05 16:54	1748	360	C5.2	AR0102	N09E28	**PICME-SH**+ICME	09/07 16:22(W)	09/08 04	09/08 20	3	F
			..	..	..	..	..	..	..	..	..	09/07 10	09/08 04	..	
58	2002/10/01 17	-176	S	09/26 01:31	178	202	NO	UNK	UNK	SH+**MC**+CIR	09/30 07:54(W)	09/30 20	10/02 03	3	F
59	2002/10/04 09	-146	S	09/30 02:30	258	120	NO	QS	S17W17	SH+**MC**	10/02 22:41(W)	10/03 01	10/04 18	1	F
60	2002/10/07 08	-115	C	10/05 01:48(CH)	..	..	..	CH	S07	**CIR**	..	..	..	1	
61	2002/10/14 14	-100	C	10/11 02:39(CH)	..	..	..	CH	S26	**CIR**	..	..	..	1	
62	2002/11/21 11	-128	C	11/18 13:21(CH)	..	..	..	CH	S04	**CIR**	11/20 10:49(W)	..	..	1	F
63	2003/05/30 00	-144	M	05/28 00:50	1366	360	X3.6	AR0365	S11W12	**SH(M)**+ICME(M)	05/29 11:55(A)	05/29 13	05/29 18	2	F
			..	05/27 23:50	964	360	X1.3	AR0365	S0W17	..	05/29 18:31(W)	05/30 02	05/30 16	..	
			..	05/27 06:50	509	360	M1.6	AR0365	S07W14	..	..	..	..	..	
64	2003/06/18 10	-141	M	06/14 01:54	875	195	NO	QS	N22W15	SH(M)+ICME(M)+**PICME-SH**	06/16 18	06/17 07	06/18 09	2	F
			..	06/15 23:54	2053	360	X1.3	AR0386	S07E80	..	06/18 04:42(W)	..	..	..	
65	2003/07/12 06	-105	C	07/07 21:40(CH)	..	..	..	CH	N04	**CIR**	..	..	..	1	
66	2003/08/18 16	-148	S	0814 20:06	378	360	NO	UNK	UNK	SH+**MC**	08/17 13:45(A)	08/18 01	08/19 15	3	F
67	2003/10/30 01	-353	S	10/28 11:30	2459	360	X17.2	AR0486	S16E08	SH+**MC**	10/29 05:58(W)	10/29 11	10/30 03	1	F
68	2003/10/30 23	-383	S	10/29 20:54	2029	360	X10.0	AR0486	S15W02	**SH**+MC	10/30 16:19(W)	10/31 02	11/02 00?	1	
69	2003/11/20 21	-422	S	11/18 08:50	1660	360	M3.9	AR0501	N00E18	SH+**MC**	11/20 08:35(W)	11/20 10	11/21 01	1	F
70	2004/01/22 14	-149	S	01/20 00:06	965	360	C5.5	AR0540	S13W11	SH+**ICME**	01/22 01:05(A)	01/22 08	01/23 17	1	F
71	2004/02/11 18	-109	C	02/10 09:24(CH)	..	..	..	CH	N02	**CIR**	..	..	..	1	

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1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ID[a]	Dst (min)		S-IP[b]	CME			Flare	Source[d]	Source[e]	IP Solar Wind[f]	Shock[g]	ICME		CL[h]	FN[i]
	Time (UT)	Int. (nT)	Driver (Type)	Time[c] (UT)	Vel km/s	AW (d)	Class	Region (Type)	Coord.	Structure (Type)	Time (UT)	Start (UT)	End UT		
72	2004/04/04 01	-112	S	03/31 10:36(F)	..	..	C3.4	AR0582	N16W10	**SH**+MC	04/03 09:00(A)	04/04 00	04/05 18	2	F
73	2004/07/23 03	-101	S	07/20 13:31	710	360	M8.6	AR0652	N10E35	SH+**ICME**	07/22 09:45(W)	07/22 18	07/24 08	1	F
74	2004/07/25 12	-148	S	07/22 08:30	899	132	C5.3	AR0652	N02E08	SH+**MC**	07/24 05:32(W)	07/24 14	07/25 15	1	F
75	2004/07/27 14	-197	S	07/25 14:54	1333	360	M1.1	AR0652	N04W30	SH+**MC**	07/26 22:25(W)	07/27 02	07/27 15	1	
76	2004/08/30 23	-126	S	08/25 13:31	108	182	NO	UNK	UNK	**MC**+CIR	08/29 09:09(W)	08/29 19	08/30 22	3	F
77	2004/11/08 07	-373	M	11/04 23:30	1055	293	M5.4	AR0696	N08E18	SH(M)+**MC(M)**	11/07 01:55(A)	11/07 22	11/09 10	2	
			..	11/04 09:54	653	360	C6.3	AR0696	S09E28	..	11/07 17:59(W)	..	..	..	
78	2004/11/10 10	-289	M	11/07 16:54	1759	360	X2.0	AR0696	N09W17	PICME-SH+**MC**	11/09 09:25(W)	11/09 20	11/23 20	2	F
			..	11/06 02:06	1111	214	M9.3	AR0696	N09E05	..	..	..	..	..	
79	2005/01/18 08	-121	M	01/15 23:06	2861	360	X2.6	AR0720	N16W05	**SH(M)**	01/17 07:15(A)	..	..	2	F
			..	01/15 06:30	2049	360	M8.6	AR0720	N16E04	..	..	..	..	..	
80	2005/01/22 06	-105	S	01/20 06:54	882	360	X7.1	AR0720	N12W58	SH + **ICME**	01/21 16:52(A)	01/21 20	01/22 17	1	
81	2005/05/08 14	-127	C	05/07 01:36(C)	..	..	..	CH	N10	**CIR**	..	..	..	1	
82	2005/05/15 08	-263	S	05/13 17:12	1128	360	M8.0	AR0759	N12E12	SH+**MC**	05/15 02:11(A)	05/15 06	05/17 12	1	
83	2005/05/20 09	-103	S	05/16 13:50	405	360	C1.2	AR0759	N13W29	**ICME**	..	05/20 04	05/21 05	1	F
84	2005/05/30 10	-138	S	05/26 15:06	586	360	B7.5	AR0767	S12E13	**ICME**	05/29 09:05(A)	05/31 01	05/30 23	2	F
85	2005/06/12 22	-106	S	06/09 14:35	377	125	C1.4	AR0776	N07E12	**MC**	06/12 04(A)	06/12 16	06/13 13	3	F
86	2005/08/24 11	-216	M	08/22 01:31	1194	360	M2.6	AR0798	S11W54	**SH(M)** + ICME(M)	08/24 05:45(A)	..	..	2	
			..	08/22 17:30	2378	360	M5.6	AR0798	S12W60	..	..	..	..	..	
87	2005/08/31 16	-131	C	08/29 10:48(C)	..	..	..	CH	S12	**CIR**	..	..	..	1	
88	2005/09/11 11	-147	S	09/09 19:48	2257	360	X6.2	AR0808	S10E58	SH+**ICME**	09/11 01:00(A)	09/11 05	09/12 07	2	F

[a] Event number in chronological order

[b] Solar and IP source type: S - single CME/ICME, M - multiple CMEs/ICMEs, C - Coronal Hole/CIR

[c] Time of first CME appearance in LASCO C2, except for (F), the onset time of the source flare, and (CH), the central meridian crossing time of the source coronal hole. "UNK" source unknown, "DG" LASCO data gap.

[d] Solar surface source region indicated by the NOAA active region number, or CH for a coronal hole, QS for a quiet Sun region, UNK if the source region can not be identified in the available observations, and DG for EIT data gap

[e] Surface source region heliographic coordinates. In the case of coronal holes, only the latitude is given. UNK and DG are defined as in footnote d

[f] Solar wind structures associated with the geomagnetic storm in time order. SH=sheath; ICME=interplanetary CME; MC=magnetic cloud. (M) indicates multiple structures of this type. "-" indicates an interaction between two structures, in particular, PICME-SH and PMC-SH denote a shock propagating through a preceding ICME or magnetic cloud respectively. Bold type indicates the structure associated with the peak of the storm; other structures that contribute to the storm (typically at the $>\sim -100$ nT level) are indicated in normal type.

[g] Shock passage time at ACE (A), WIND (W) or inferred from a geomagnetic storm sudden commencement (SC). If no shock is present, this is the arrival time of CME-driven disturbances.

[h] Overall confidence level of the solar source identification. "1" = unambiguous, with unanimous consensus from the Working Group members. "2" = more ambiguous, with several possible sources, but most group members agree on the identification listed. M-type events fall into this category because of their intrinsic complexity. "3" = ambiguous or problematic events. Events in this category are mostly driven by ICMEs with no obvious front-side halo CME counterpart identified. The CMEs listed are possible candidates; those without any surface signatures in the available observations are indicated by "UNK" in columns 9 and 10. See the footnotes and text for more discussion on the questionable events.

[i] Additional comments are in the footnote numbered according to the event number.

[2] Proposed CME 04/16 07 had no corresponding surface eruption signature in EIT. An alternative solar driver is an EIT dimming at 04/16 14 UT at S22E04. However, this dimming has no corresponding CME in LASCO.

[4] Filament eruption, no EIT dimming. The surface source region is near NOAA AR8090.

[6] LASCO/EIT data gap, but C1 LDE flare, and cusp in SXT.

[7] Proposed CME 02/12 15 had no corresponding surface eruption signature in EIT. Partial halo CME 02/14 06 is too close to the ICME arrival time, because the slow solar wind and slow CME speed imply a longer transit time.

[9] A complex flow event involving multiple CMEs/ICMEs. The onset of this flow was caused by CME 04/29 17. The shock associated with the principle CME (05/02 14) driving the storm arrived at 05/04 02:15(A).

[10] Storm driven by the second MC. EIT data gap. Surface sources inferred from SXI.

[11] LASCO/EIT data gap. No major flare activity.

[12] LASCO/EIT data gap. No major flare activity.

[13] LASCO/EIT data gap. X1.0 LDE flare.

[14] LASCO/EIT data gap. M7.1 LDE flare

[15] Slow filament eruption.

[16] Bs mainly in the first ICME.

[18] The source region is in the quiet Sun between two active regions.

[19] LASCO/EIT data gap. No major flare activity.

[20] LASCO/EIT data gap. M3.2 flare

[23] LASCO/EIT data gap.

[26] Both CMEs are not in the original catalog. LASCO images indicated multiple CMEs interacting in the field of view.

[28] Surface source region of the 08/06 23 UT has not been identified. Maybe it is a backside CME? An alternative driver is the CME at 08/08 15 UT, but the source region is at N25W75, and this may be difficult to reconcile with a MC counterpart at the Earth.

[31] Three < -100 nT minima, caused by the magnetic cloud, a shock running into this magnetic cloud, and an ICME.

[33] Surface source region showed weak dimming in EIT and was between two active regions.

[34] Surface source region largely unknown. One possibility is a large-scale dimming spanning four small active regions (ARs 9218, 9213, 9212 and 9214) with a centroid at N10E05.

[35] Three FH CMEs on 11/24 may be also involved in the early part of the complex solar wind flow.

[36] CME 03/16 03 UT lacked a disc signature in EIT, so it may be a backside CME. An alternative source is the EIT eruption at 03/15 21 UT, but this did not produce a CME in LASCO.

[39] Big SEP, LASCO ""snowstorm"". However, the near-limb source may not be consistent with the MC present at 1 AU. An alternative source is the PH CME at 04/14 21 UT from N45E15.

[40] No good solar driver can be found. A filament eruption occurred at 04/17 13 UT close to southern polar region, but it produced a narrow and weak CME not listed in the CME Catalog. PH CME at 04/19 12 UT from N19W22 corresponded to a transit time of about 50 hours, which was inconsistent with the slow ICME and CME speed.

[47] EIT data gap.

[51] Double Dst peak.

[54] GOES M4.7 flare at 07/29 10:27 UT was not associated with CME 07/29 12 UT.

[54] Surface source region for this CME can not be identified. There was no apparent eruption signature seen in EIT.

[55] PH CME 08/18 21 UT was too slow, not compatible with a 1000 km/s transit speed. But CME 08/16 12 must have slowed down significantly before reaching the Earth, possibly affected by a preceding CME.

[56] EIT data gap. CH central meridian transit time was extrapolated from earlier observations.

[57] M-type, what is the other solar CME? FH CME at 09/05 16 UT showed EIT dimming, wave and arcade.

[58] The CME was a gradual one, growing more promient in C3 than in C2. However, there was no apparent eruption signature seen in EIT. CIR was involved in the SW flow.

[59] CME not in the original CDAW catalog.

[62] EIT data gap. CH central meridian transit time was extrapolated from earlier observations.

[63] SMEI halo CME (best one); 5/28, 16:53 thru 5/29. EIT 304 instead of EIT 195 observations.

[64] SMEI CME. EIT arcade associated with PH CME 06/14 01 UT.

[66] Strong halo CME, but no appreciable EIT signature: no dimming, no flare. There might be an extremely weak wave from S30E00.

[67] Two Dst dips.

[69] SMEI CME 11/19, 05:48. 50-75°.

[70] SMEI CMEs on 1/21, 03:49 and 22, 04:14. 35-80°.

[72] C3.4 LDE flare. Eruption seen in SXI. LASCO/EIT data gap. Halo CME in C3 at 04/01 00:25 UT. Sheath and cloud boundary unclear. SMEI CMEs 3/31 - 4/3. Out to 90°

[73] Complete chain is shown with SMEI. Shock and cloud boundary unclear.

[74] SMEI CME loops at 7/20, 21:29 and 21, 16:02 match LASCO CME structure well.

[76] CME 08/25 13 UT is gradual; apparent eruption signature seen in EIT. Could be a front-side CME? Or backside? An alternative driver is CME at 08/26 12 UT. However, the transit time was probably too short, not compatible with the CME and ICME speeds.

[78] SMEI CME 11/8, 19:22: several parts or events. 40-85°.
[79] No clear ejecta signatures.
[83] No CME-driven shock.
[84] EIT 304 only.
[85] EIT data gap. Source CME inconclusive.
[88] LASCO/EIT data gap from 09/07 to 09/09.