

Space Weather Highlights
04-10 May 1998

Solar activity was at moderate to high levels during most of the period. Region 8210 (S17, L = 140, class/area Dko/480 on 05 May) produced major flares on 06 and 09 May. All told, the region produced six major flares between 23 April and 09 May making it the most productive region to date for Cycle 23. The week's first major flare was an X2/2N at 06/0809UT accompanied by a Type IV radio sweep, moderate centimetric radio bursts and a partial-halo CME. The second major flare was an M7 at 09/0340UT associated with a Type IV sweep and a 210 SFU Tenflare. There was no optical flare associated with the M7, but space-based images indicated 8210 was the source region (1 1/2 days behind the limb at the time of the flare). Region 8210 also produced low-level M-class flares during 05 - 08 May. The most interesting of these was an M2/2N at 05/2346UT associated with Types II and IV radio sweeps and a partial-halo CME. Region 8214 (N27, L = 096, class/area Fkc/650 on 05 May) produced two M-class flares on 07 May during a period of moderate growth, then stabilized for the rest of the period. Region 8220 (S31, L = 287, class/area Hsx/200 on 10 May) produced an M3/SF flare at 10/1320UT as it crossed the east limb.

Solar wind data were available from the ACE spacecraft during most of the period. Velocities rapidly increased from 480 - 840 km/sec on 04 May following an interplanetary shock passage at 04/0229UT (the source was most likely the X1/3B flare of 02 May, see PRF #1183), then gradually decreased to 460 km/sec by 06 May. Velocities increased from 460 - 690 km/sec on 08 May, then gradually declined during the rest of the period. Solar wind particle densities increased to 18 p/cc on 04 May, then declined to a range of 02 - 05 p/cc for the rest of the period. Bz shifted strongly southward (maximum deflection minus 40 nT (GSM)) early on 04 May following the shock passage mentioned above and was highly variable (plus to minus 20 nT) for the remainder of the day. Bz ranged from plus 12 to minus 08 nT during the remainder of the period. Solar sector orientation was not easily discernible due to high variability during the summary period.

A Solar Proton Event (SPE) followed the X2/2N flare of 06 May. The greater than 10 MeV proton flux reached event threshold at 06/0835UT, reached a peak of 210 PFU at 06/1650UT and ended at 07/0140UT. The greater than 100 MeV proton flux reached event level at 06/0830UT, reached a maximum of 2.9 PFU at 06/0840UT, then dropped below threshold at 06/1335UT. A greater than 10 MeV proton flux enhancement followed the M7 flare of 09 May. It began near 09/0600UT and ended early 11 May. The greater than 2 MeV electron flux at geosynchronous altitude was normal on 04 May, but increased to moderate to high levels for the rest of the period.

A geomagnetic storm occurred in the wake of the X1/3B flare of 02 May. An interplanetary shock was detected by the ACE spacecraft at 04/0229UT followed by a sudden storm commencement (SSC) at Earth at 04/0300UT. The magnitude of the SSC was 86 nT, as measured by the Boulder USGS magnetometer. Severe storm levels (K = 8 to 9) occurred during 04/0300 - 0900UT followed by active to major storm levels. The storm ended at 05/0900UT. Activity declined to quiet to unsettled levels during 06 - 07 May. Field activity increased again on 08 May with unsettled to active levels detected at all latitudes. The field returned to quiet to unsettled levels for the balance of the period.

Space Weather Forecast
13 May 1998 -08 June 1998

Solar activity is expected to range from low to moderate. M-class flares are forecast during 21 May - 02 June due to expected return of old Region 8210. Chances for solar proton events are expected to increase during 26 May - 02 June, given the expected return of old region 8210.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels during 23 - 26 May. Otherwise, fluxes are expected to be normal to moderate.

The geomagnetic field is expected to be at unsettled to active levels during 22 - 24 May due to recurrent coronal hole effects. Quiet to unsettled levels are expected during the rest of the period.



Daily Solar Data

Date	Radio Flux	Sun spot No.	Sunspot Area	X-ray Background	X-ray Flux			Flares				
	10.7 cm	(10 ⁶ hemi.)			C	M	X	S	1	2	3	4
04 May	121	117	980	B5.8	5	0	0	5	2	0	0	0
05 May	133	105	1170	B4.6	13	1	0	14	1	2	0	0
06 May	130	111	1070	C1.8	10	1	1	24	2	0	0	0
07 May	123	82	1100	C2.4	7	2	0	17	2	0	0	0
08 May	118	81	620	B9.9	4	3	0	2	1	0	0	0
09 May	111	56	530	C1.0	13	1	0	1	0	1	0	0
10 May	107	61	540	B8.7	14	2	0	2	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
04 May	1.2E+7	2.6E+5	5.2E+3		4.5E+6	
05 May	1.2E+7	3.7E+4	2.8E+3		5.7E+8	
06 May	7.5E+6	2.4E+6	5.7E+4		6.4E+8	
07 May	1.6E+7	3.7E+5	1.0E+4		1.1E+9	
08 May	3.0E+6	2.6E+4	4.3E+3		2.5E+8	
09 May	3.6E+6	3.2E+5	7.9E+3		3.6E+8	
10 May	2.4E+6	2.6E+5	6.1E+3		2.1E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 May	90	6-9-7-4-4-3-2-3	61	5-7-6-7-5-3-2-2	96
05 May	23	3-6-3-2-4-4-2-1	46	3-6-6-5-5-6-3-1	36	3-6-5-3-5-5-4-2
06 May	5	1-2-0-2-2-1-1-2	8	1-2-0-2-4-2-1-1	8	2-2-1-2-3-3-2-2
07 May	10	2-3-0-3-2-2-3-3	10	2-2-1-4-3-2-1-2	13	3-3-2-4-2-3-3-3
08 May	24	4-3-4-3-4-5-3-2	30	3-3-5-5-5-5-2-2	20	4-4-4-4-4-4-3-3
09 May	8	1-3-2-2-3-2-2-2	24	2-3-4-4-3-2-2-2	12	2-3-3-3-2-3-3-2
10 May	7	1-1-2-3-2-1-2-3	*	2-3-6-4-*-2-1-2	11	2-1-3-3-3-2-2-3

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
04 May 0000	K= 4 Observed	03 May 21-24
04 May 0121	5-245MHz Radio Bursts	03 May
04 May 0121	245 Radio Noise Storm	03 May
04 May 0301	K= 5 Observed	04 May 00-03
04 May 0324	Sudden Impulse 86 nT at Boulder	04 May 0301
04 May 0557	A ≥ 50 Observed	04 May 0600
04 May 0557	K ≥ 6 Observed	04 May 03-06
04 May 0901	K ≥ 6 Observed	04 May 06-09

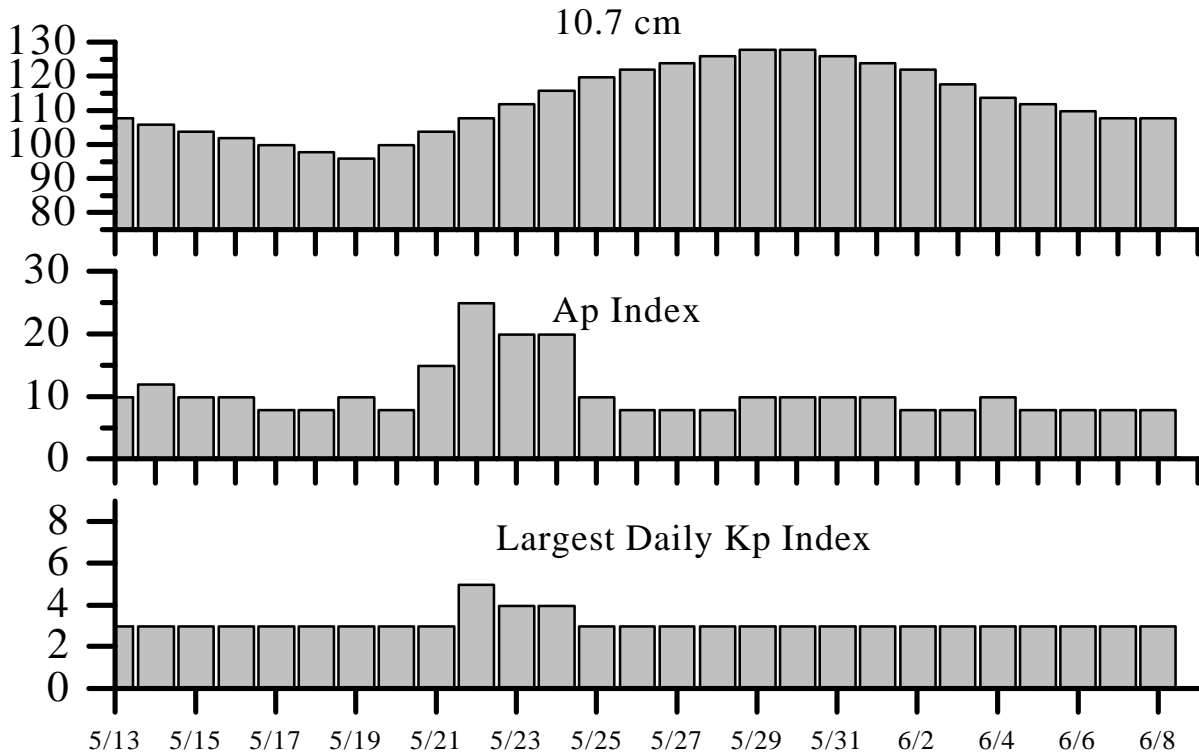


Alerts and Warnings Issued – continued.

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
04 May 1211	K= 6 Observed	04 May 09-12
04 May 1238	ENDED Proton Event ≥ 10 pfu @ ≥ 10 MeV	02 May 1420
05 May 0600	K ≥ 6 Observed	05 May 03-06
05 May 0900	K= 4 Observed	05 May 06-09
05 May 1514	K= 4 Observed	05 May 12-15
05 May 1815	ENDED A ≥ 50 Observed	04 May 0600
05 May 1815	ENDED A ≥ 30 Observed	04 May 0900
05 May 2144	A ≥ 20 Watch	06 May
06 May 0006	>2 MeV Electron Event in Progress ≥ 1000 pfu	05 May
06 May 0011	Type II Radio Emission	05 May 2345
06 May 0048	2695MHz Radio Burst	05 May 2329
06 May 0048	Type IV Radio Emission	05 May 2338
06 May 0136	7-245MHz Radio Bursts	05 May
06 May 0136	245 Radio Noise Storm	05 May
06 May 0825	Proton Event Warning ≥ 10 pfu @ ≥ 10 MeV	06 May 1200
06 May 0846	Proton Event > 1 pfu @ ≥ 100 MeV	06 May 0830
06 May 0859	Proton Event ≥ 10 pfu @ ≥ 10 MeV	06 May 0835
06 May 0924	X-Ray event X2.7/1n	06 May 0758
06 May 0928	Type IV Radio Emission	06 May 0801
06 May 1023	2695MHz Radio Burst	06 May 0801
06 May 2008	A ≥ 20 Watch	09 May
06 May 2008	A ≥ 30 Watch	08 May
07 May 0008	>2 MeV Electron Event in Progress ≥ 1000 pfu	06 May
08 May 0002	>2 MeV Electron Event in Progress ≥ 1000 pfu	07 May
08 May 0121	8-245MHz Radio Bursts	07 May
08 May 0121	245 Radio Noise Storm	07 May
08 May 0241	Type II Radio Emission	08 May 0200
08 May 0300	K= 4 Observed	08 May 00-03
08 May 0623	2695MHz Radio Burst	08 May 0556
08 May 0701	Type II Radio Emission	08 May 0604
08 May 0701	Type IV Radio Emission	08 May 0609
08 May 2107	A ≥ 20 Observed	08 May 1800
09 May 0015	>2 MeV Electron Event in Progress ≥ 1000 pfu	08 May
09 May 0407	X-Ray event M7/SF	09 May 0304
09 May 0441	2695MHz Radio Burst	09 May 0323
09 May 0508	Type IV Radio Emission	09 May 0331
10 May 0042	>2 MeV Electron Event in Progress ≥ 1000 pfu	09 May
10 May 1332	2695MHz Radio Burst	10 May 1317



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
13 May	108	10	3	27 May	126	8	3
14	106	12	3	28	128	10	3
15	104	10	3	29	128	10	3
16	102	10	3	30	126	10	3
17	100	8	3	31	124	10	3
18	98	10	3	01 Jun	122	8	3
19	96	10	3	02	118	8	3
20	104	15	3	03	114	10	3
21	108	25	5	04	112	8	3
22	112	20	4	05	110	8	3
23	116	20	4	06	108	8	3
24	120	10	3	07	108	8	3
25	122	8	3	08	108	8	3
26	124	8	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max		Flux		Lat	CMD		245	2695	II	IV
05 May	2327	2346	0002	M2.5	.034	2N	S16W60	8210	250	150	3	2	
06 May	0710	0725	0741	M2.9	.037	1N	S11W65	8210	830				
06 May	0758	0809	0820	X2.7	.210	1N	S11W65	8210	65000	490		3	
07 May	1105	1116	1127	M2.9	.026	1B	N29W47	8214	26				
07 May	1331	1350	1405	M1.3	.017	SF	N28W47	8214	150	22			
08 May	0149	0204	0217	M3.1	.031				2400	30			
08 May	0553	0608	0626	M1.4	.020				2900	430	2	3	
08 May	1350	1415	1437	M1.8	.036								
09 May	0304	0340	0355	M7.7	.110				56	210		3	
10 May	0815	0826	0845	M1.6	.021				79				
10 May	1313	1320	1323	M3.9	.010	SF	S29E88		320				

Flare List

Date	Time			X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
04 May	0016	0107	A0130	B9.2	1F	S11W41	8210
	0341	0357	0430	C1.0			
	0810	0812	0814	B8.4	SF	N25W02	8214
	1544	1547	1551	B8.6			
	1658	1716	1748	C2.9	1F	N27W05	8214
	1824	1831	1840	C1.1			
	2017	2017	2022		SF	N26W04	8214
	2059	2103	2108	B5.8			
	2112	2118	2131	B8.9			
	2148	2149	2159		SF	N25W12	8214
05 May	2247	0005	0035	C3.0	SF	S18W48	8210
	2258	2305	2315	C1.9	SF	N28W06	8214
	0438	0443	0446	C1.1			
	0515	0518	0520	B7.1			
	0530	0530	0534	C1.5	SF	S12W50	8210
	0755	0756	0758		SF	N27W08	8214
	0932	0942	0946	C1.1			
	1028	1034	1037	C2.2			
	1156	1202	1204	C7.7			
	B1240	1308	1318		SF	N25W18	8214
	1319	1329	1339		SF	N26W19	8214
	1343	1343	1348		SF	N26W18	8214
	1349	1351	1355		SF	N25W18	8214
	1612	1615	1618	C1.2	SF	N26W18	8214
1622	1628	1645	C3.6	SF	N26W18	8214	
1635	1647	1655		SF	S14W60	8210	
1635	1635	A1707		SF	N26W17	8214	
1802	1802	1823		SF	N27W20	8214	



Flare List – continued.

Date	Time			X-ray Class.	Imp / Brtns	Optical	Rgn #
	Begin	Max	End			Location Lat CMD	
05 May	1823	1855	2030	C3.5	1F	N26W22	8214
	1927	1938	1942	C7.3			
	2049	2053	2115	C2.6	SF	N26W22	8214
	2214	2218	2224	C2.3	SF	N26W23	8214
	2246	2252	2256		SF	N25W25	8214
	2304	2342	0112	C2.4	2N	S15W60	8210
	2316	2319	2321	C2.1			
	2329	2341	0045	M2.5	2N	S16W60	8210
06 May	0025	0035	0041		SF	N26W20	8214
	0044	0044	0049		SF	N26W20	8214
	0225	0227	0230		SF	N26W21	8214
	0441	0442	0447	C4.0	SF	S12W63	8210
	0453	0506	0517	C8.4			
	0533	0534	0537		SF	S12W65	8210
	0610	0610	0616	C2.8	SF	S12W65	8210
	0627	0629	0635	C3.8	SF	S14W66	8210
	0702	0704	0707	C3.7	SF	S13W66	8210
	B0725	U0725	A0745	M2.9	1N	S11W65	8210
	0758	0804	0905	X2.7	1N	S11W65	8210
	0847	0848	0853		SF	N27W29	8214
	1335	1337	1345	C6.8	SN	S16W68	8210
	1435	1437	1440		SF	N27W29	8214
	1512	1513	1515		SF	N28W36	8214
	1545	1546	1549		SF	S15W73	8210
	1640	1642	1650		SF	S14W72	8210
	1653	1656	1658	C1.6			
	1711	1712	1721	C3.1	SF	S14W74	8210
	1711	1712	1715		SF	N28W37	8214
	1818	1822	1823		SF	S23E82	8218
	1825	1830	1840		SF	S13W76	8210
	1838	1839	1902	C2.9	SF	N28W32	8214
	2118	2122	2132		SF	N26W31	8214
	2207	2208	2213	C1.5	SF	S14W72	8210
	2238	2239	2247		SF	S22E77	8218
	2257	2302	2309		SF	N28W36	8214
	2257	2302	2310	C2.9	SF	S22E77	8218
2343	2346	2352		SF	N28W36	8214	
07 May	0109	0109	0114	C3.5	SF	N29W40	8214
	0403	0407	0414		SF	S24E72	8218
	0606	0606	0616		SF	S24E71	8218
	0632	0635	0652		SF	S23E70	8218
	0653	0655	0706		SF	S23E71	8218
	B0729	U0729	A0737	C4.8	SF	S22E73	8218



Flare List – continued.

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #	
	Begin	Max	End			Location Lat CMD			
07 May	1107	1114	1156	M2.9	1B	N29W47	8214		
	1328	1330	1333		SF	S23E68	8218		
	1340	1342	1345	M1.3	SF	N28W47	8214		
	1438	1459	1509		SF	S23E68	8218		
	1441	1449	1520	C3.7	1F	N27W41	8214		
	1533	1548	1600		SF	S23E67	8218		
	1605	1607	1613		SF	N26W41	8214		
	1614	1621	1643	C2.0	SF	N26W41	8214		
	1637	1642	1646	C1.9					
	1907	1909	1918		SF	N31W53	8214		
	1912	1914	1916		SF	S21E59	8218		
	1927	1928	1934		SF	S23E64	8218		
	2151	2152	2155		SF	S23E63	8218		
	2224	2229	2235	C1.8					
	2313	2316	2320		SF	S23E61	8218		
	08 May	0149	0204	0217	M3.1				
		0553	0608	0626	M1.4				
B1251		U1304	A1340	C5.4	1N	N25W51	8214		
1350		1415	1437	M1.8					
1615		1615	1618		SF	N28W53	8214		
2117		2130	2146	C3.5					
09 May	2256	2256	2304	C2.7	SF	N32W65	8214		
	2340	2344	2350	C3.2					
	0015	0027	0037	C8.3					
	0149	0213	0233	C7.0					
	0304	0340	0355	M7.7					
	0534	0540	0545	C6.2					
	1031	1037	1048	C2.9	2F	N29W72	8214		
	1102	1104	1113	C4.7	SF	N29W71	8214		
	1305	1315	1324	C6.6					
	1356	1401	1417	C2.0					
10 May	1426	1431	1437	C1.9					
	1726	1738	1757	C4.5					
	2027	2035	2043	C3.9					
	2127	2136	2145	C2.7					
	2232	2236	2246	C1.6					
	2331	2338	2345	C3.5					
	0044	0049	0100	C1.9					
	0305	0318	0334	C4.0					
	0344	0354	0401	C5.7					
	0438	0504	0519	C2.4					
	0523	0528	0534	C2.9					
	0640	0647	0650	C1.4					



Flare List – continued.

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
10 May	0702	0716	0721	C1.3				
	0724	0728	0733	C1.4				
	0815	0826	0845	M1.6				
	0944	0948	0953	C2.1				
	1055	1058	1102	C1.1				
	1145	1149	1156	C1.5	SF	S28E87		
	1321	1322	1324	M3.9	SF	S29E88		
	1508	1511	1515	C1.0				8220
	1718	1722	1732	B6.3				
	1808	1812	1816	B8.4				
	1925	1929	1931	C1.6				
	2025	2028	2031	C1.3				
	2144	2148	2153	B9.5				
	2326	2330	2337	B5.8				

Region Summary

Date	Location		Sunspot Characteristics					Flares																	
	(° Lat ° CMD)	Helio	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical														
		Lon						C	M	X	S	1	2	3	4										
<i>Region 8210</i>																									
24 Apr	S19E70	151	0000	00		000																			
25 Apr	S16E67	140	0230	08	DSO	005	B	2				2	1												
26 Apr	S17E56	138	0200	09	CKO	009	B					1													
27 Apr	S17E42	139	0200	08	CKO	009	BD				1	1		1											
28 Apr	S17E30	138	0300	08	CKO	015	BGD					7													
29 Apr	S17E18	137	0230	08	CHO	016	BG	2	1			6	2	1	1										
30 Apr	S16E02	140	0270	10	CHO	022	BG	1				1		1											
01 May	S17W10	138	0340	10	DKI	030	GD	4	1			9													
02 May	S17W22	137	0420	11	EKI	040	BGD	2			1	8				1									
03 May	S17W36	138	0410	10	CKI	030	BG	2	1			2	2												
04 May	S17W47	136	0430	07	CKO	014	BD					1	1												
05 May	S17W60	136	0480	07	DKO	010	B	2	1			2		2											
06 May	S15W75	137	0390	08	CKO	013	B	7	1			11	2												
07 May	S15W85	134	0270	05	CAO	005	B																		
								22 5 2 51 8 5 2 0																	

Crossed West Limb.

Absolute heliographic longitude: 140



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares														
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
		Lon						C	M	X	S	1	2	3	4						
<i>Region 8213</i>																					
28 Apr	S25E54	114	0010	03	BXO	005	B														
29 Apr	S24E40	115	0020	05	BXO	007	B														
30 Apr	S25E30	112																			
01 May	S25E17	112																			
02 May	S25E04	112																			
03 May	S25W09	112																			
04 May	S25W22	112																			
05 May	S25W35	112																			
06 May	S22W50	112	0010	03	BXO	002	B														
07 May	S22W63	112																			
08 May	S22W76	112																			
09 May	S22W89	112																			

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 112

<i>Region 8214</i>																					
29 Apr	N28E60	097	0000	00	AXX	001	A														
30 Apr	N26E47	095	0040	05	CRO	009	B					6									
01 May	N26E33	095	0140	09	DAI	028	BG	1	1			10	1								
02 May	N27E19	096	0200	10	EAI	027	B	2				5	1								
03 May	N27E06	096	0300	13	ESC	050	B	1	1			8									
04 May	N27W08	097	0510	14	EKI	060	B	2				4	1								
05 May	N27W23	099	0650	17	FKC	052	BG	3				12	1								
06 May	N27W34	096	0620	17	FHC	043	B	1				11									
07 May	N27W48	097	0620	18	FKC	031	B	3	2			5	2								
08 May	N28W61	097	0380	18	FKI	021	B	2				2	1								
09 May	N27W74	096	0240	16	CHO	006	B	2				1		1							
10 May	N26W84	093	0090	13	CSO	005	B														

17 4 0 64 7 1 0 0

Still on Disk.

Absolute heliographic longitude: 096

<i>Region 8215</i>																					
30 Apr	N31W44	186	0000	04	BXO	002	B														
01 May	N31W57	186																			
02 May	N31W70	186																			
03 May	N31W83	186																			

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 186



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares													
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical									
		Lon						C	M	X	S	1	2	3	4					
<i>Region 8216</i>																				
30 Apr	S21E51	091	0000	00	AXX	001	A													
01 May	S22E38	090	0010	00	AXX	001	A													
02 May	S21E25	090	0000	00	AXX	001	A													
03 May	S22E12	090	0000	01	AXX	002	A													
04 May	S22E00	089	0000	01	AXX	002	A													
05 May	S22W13	089	0000	01	AXX	002	A													
06 May	S22W26	089																		
07 May	S22W39	089																		
08 May	S22W52	089																		
09 May	S22W65	089																		
10 May	S22W78	089																		

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 089

Region 8217

02 May	S17E74	041	0040	01	HSX	002	A												
03 May	S16E60	042	0060	02	HSX	001	A												
04 May	S16E47	042	0040	02	HSX	001	A												
05 May	S15E34	042	0040	01	HSX	001	A												
06 May	S17E21	041	0040	02	HSX	001	A												
07 May	S17E09	040	0050	02	HSX	001	A												
08 May	S16W05	041	0040	01	HSX	001	A												
09 May	S16W18	040	0030	02	HSX	001	A												
10 May	S16W31	040	0030	01	HSX	001	A												

0 0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 41

Region 8218

06 May	S23E74	348	0010	01	AXX	002	A												
07 May	S22E61	348	0160	08	DSO	005	B	1	1										
08 May	S20E48	348	0190	10	DKI	016	B												
09 May	S19E34	348	0260	12	EAI	019	B												
10 May	S20E22	347	0220	11	ESO	014	B												

1 1 0 15 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 347



Region Summary – continued.

Date	Location		Sunspot Characteristics				Flares														
	(° Lat ° CMD)	Helio	Area (10 ⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical										
		Lon						C	M	X	S	1	2	3	4						
<i>Region 8219</i>																					
08 May	N28E41	355	0010	03	BXO	003	B														
09 May	N28E28	355																			
10 May	N28E15	355																			
												0	0	0	0	0	0	0	0	0	
Still on Disk.																					
Absolute heliographic longitude: 355																					
<i>Region 8220</i>																					
10 May	S31E82	287	0200	02	HSX	001	A	1													
												1	0	0	0	0	0	0	0	0	
Still on Disk.																					
Absolute heliographic longitude: 287																					



**Recent Solar Indices (preliminary)
of the observed monthly mean values**

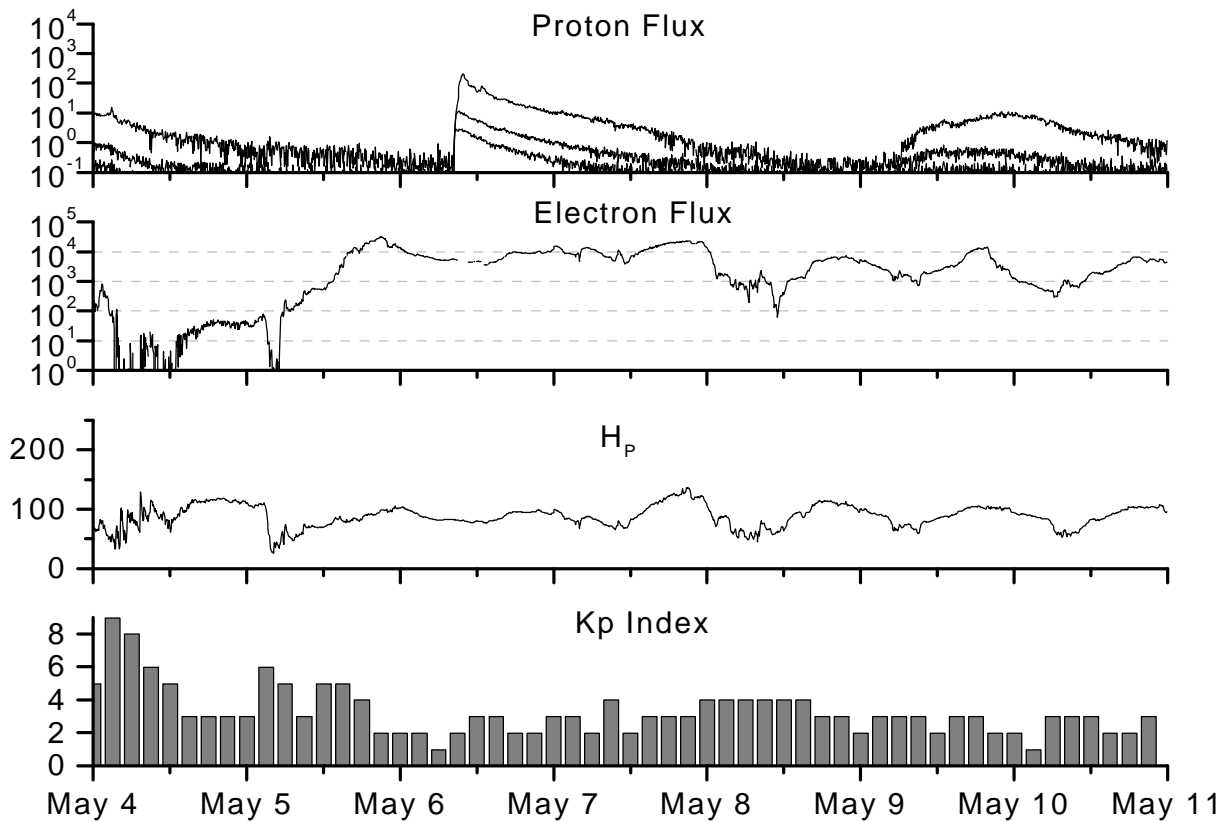
Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1996									
May	11.8	05.5	0.47	12.9	08.0	72.1	71.4	07	09.5
June	18.8	11.8	0.63	13.5	08.5	69.6	71.8	05	09.4
July	13.2	08.2	0.62	13.4	08.4	71.2	72.0	07	09.3
August	20.5	14.4	0.70	13.1	08.3	72.4	72.1	09	09.4
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	13	09.1
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
1997									
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3*
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2*
March	14.4	08.7	0.60	20.4	13.5*	73.5	75.1*	08	08.9*
April	24.5	15.5	0.63	24.0	16.5*	74.5	76.8*	10	08.6*
May	28.6	18.5	0.65	26.4	18.4*	74.6	78.4*	08	08.6*
June	22.1	12.7	0.57	29.0	20.4*	71.7	80.1*	07	08.7*
July	17.0	10.5*	0.62*	32.4	22.7*	71.1	81.8*	06*	08.5*
August	36.7	24.7*	0.67*	35.9	25.2*	79.0	83.4*	08*	08.3*
September	58.2	51.3*	0.88*	40.5	28.5*	96.2	85.7*	10*	08.2*
October	33.6	23.3*	0.69*	45.4	32.0*	84.9*	88.6*	11*	08.3*
November	53.5	39.3*	0.73*			99.5*		11*	
December	57.9	41.5*	0.72*			98.8*		05*	
1998									
January	51.8	32.3*	0.62*			93.5*		07*	
February	54.4	40.7*	0.75*			93.6*		07*	
March	81.1	54.8*	0.67*			109.4*		11*	
April	74.0	53.3	0.72*			108.0*		10*	

*Preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 22, RI=158.5 occurred July 1989.

** From June 1991 onward, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 04 May 1998

Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

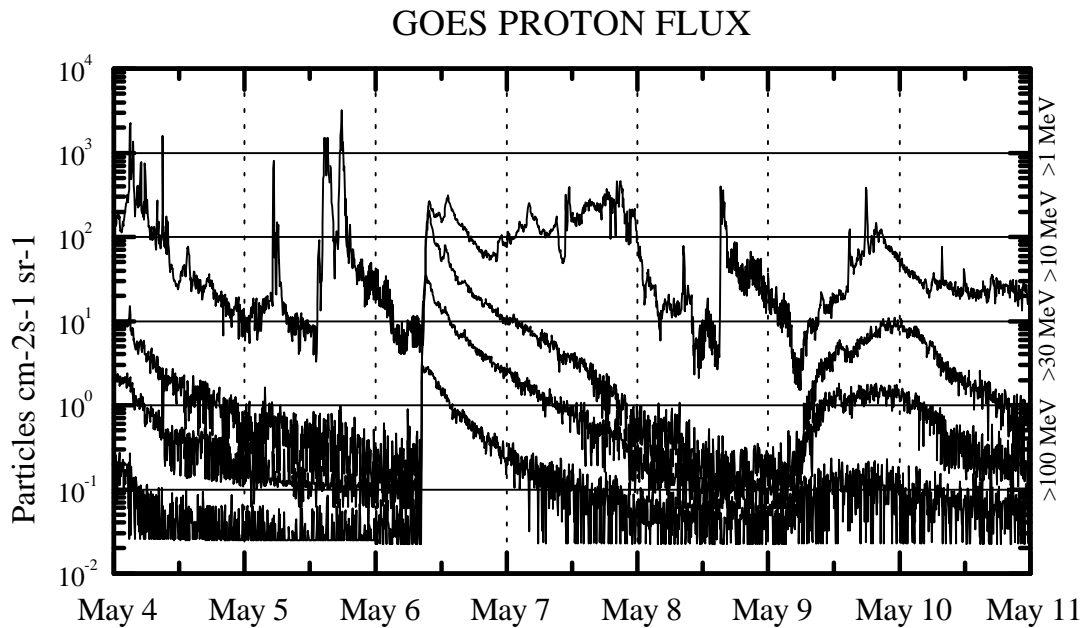
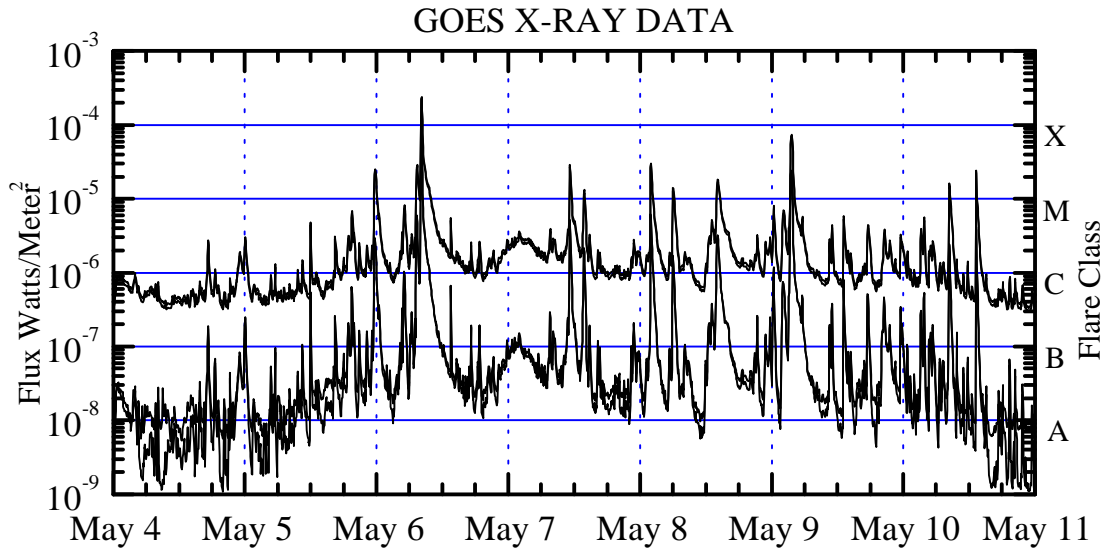
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the USAF 55th Space Weather Squadron) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Heartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K_p are "global" parameters that are applicable to a first order approximation over large areas. H_pparallel is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





Weekly GOES Satellite X-ray and Proton Plots

Proton plot contains the five minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-9 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m²) as measured by GOES 8 and 9 in two wavelength bands, .05 -.4 and .1 -.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 -.8 nm band.

