Space Weather Highlights **SWO PRF 1339**
23 - 29 April 2001 **01 May 2001**

Solar activity ranged from low to high levels. Region 9433 (N17, L = 153, class/area Fki/1070 on 25 April) produced low-level M-class flares through 25 April as it showed gradual spot growth within its interior and trailing portions (a magnetic delta configuration persisted in the trailer portion through the period). Activity reached high levels on 25 April by virtue of five low-level M-class flares from Region 9433, all of which were impulsive. Activity increased to high levels again on 26 April as Region 9433 produced the sole major flare of the period: an M7/2b at 26/1312 UTC with an associated 360 SFU Tenflare, and Type II and IV radio sweeps. SOHO/LASCO images also showed a full-halo coronal mass ejection (CME) associated with this flare. Region 9433 entered a gradual decay phase following the major flare, exhibiting gradual loss of spots in the leading and intermediate portions of the group. However, the trailer portion of the region remained complex as the delta persisted through the remainder of the period. Activity declined to moderate levels on 27 April with isolated low-level M-class flares from Region 9433. Activity dropped to low levels on 28 April and remained so for the balance of the period with isolated C-class subflares, mostly from Regions 9433 and 9441 (N08, L = 078, class/area Dai/190 on 29 April). Region 9441 produced isolated C-class subflares during a minor growth phase that occurred during 27 - 29 April, followed by gradual decay during the rest of the period. Region 9433 began to cross the west limb at the close of the period.

Data were available from the Advanced Composition Explorer (ACE) spacecraft for most of the period. A CME passage occurred during 28 - 29 April. The CME shock front reached the ACE spacecraft at 28/0342 UTC. The frontal passage was followed by abrupt increases in velocity (peak to 810 km/sec shortly following the passage) and total IMF intensity, along with a modest increase in densities. IMF Bz was initially variable following the shock passage, then turned mostly southward during 28/0900 - 1500 UTC with maximum southerly deflections to minus 18 nT (GSM). CME effects gradually subsided during 29 April.

A proton enhancement at greater than 10 MeV occurred during 26 - 27 April in the wake of the M7/2b flare of 26 April. A brief greater than 10 MeV proton event occurred on 28 April associated with the shock passage mentioned above. The event began at 28/0430 UTC, reached a maximum of 57 PFU at 28/0500 UTC, and ended at 28/0520 UTC. Proton fluxes returned to background levels on 29 April.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels during most of the period.

The geomagnetic field was disturbed on 28 - 29 April due to the CME passage described above. The disturbance began with a sudden impulse at 28/0503 UTC (76 nT, as measured by the Boulder USGS magnetometer) followed by unsettled to major storm levels. The disturbance ended around midday on 29 April. Quiet to unsettled conditions occurred during the remainder of the period.

Space Weather Outlook
02 - 28 May 2001

Solar activity is expected to range from low to moderate levels during the period. Isolated M-class flares will be possible during the period.

No proton events are expected during the period.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels during most of the period.

The geomagnetic field is expected to be disturbed around 4 May due to coronal hole effects. Unsettled to active conditions will be possible during this disturbance. Quiet to unsettled levels are expected during the remainder of the period, barring an Earth-directed CME.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	4
23 April	196	140	1420	B8.1	6	2	0	5	1	1	0	0
24 April	194	175	1520	B6.3	5	5	0	9	5	0	0	0
25 April	194	182	1530	C1.5	9	1	0	16	0	1	0	0
26 April	196	193	1410	B8.2	4	1	0	7	0	1	0	0
27 April	191	181	1530	C1.2	5	1	0	16	1	0	0	0
28 April	188	173	1480	B8.8	6	0	0	6	1	0	0	0
29 April	192	161	1400	C1.0	10	0	0	10	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2}-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4Me
23 April	2.5E+5	2.8E+4	4.6E+3		1.4E+5	
24 April	2.0E+5	2.0E+4	4.8E+3		1.0E+6	
25 April	1.7E+5	1.6E+4	4.5E+3		9.6E+6	
26 April	1.1E+5	1.5E+4	4.4E+3		6.6E+6	
27 April	4.0E+6	1.3E+5	4.5E+3		1.2E+7	
28 April	1.3E+8	2.8E+5	3.8E+3		4.5E+6	
29 April	1.8E+6	1.4E+4	2.6E+3		1.1E+6	

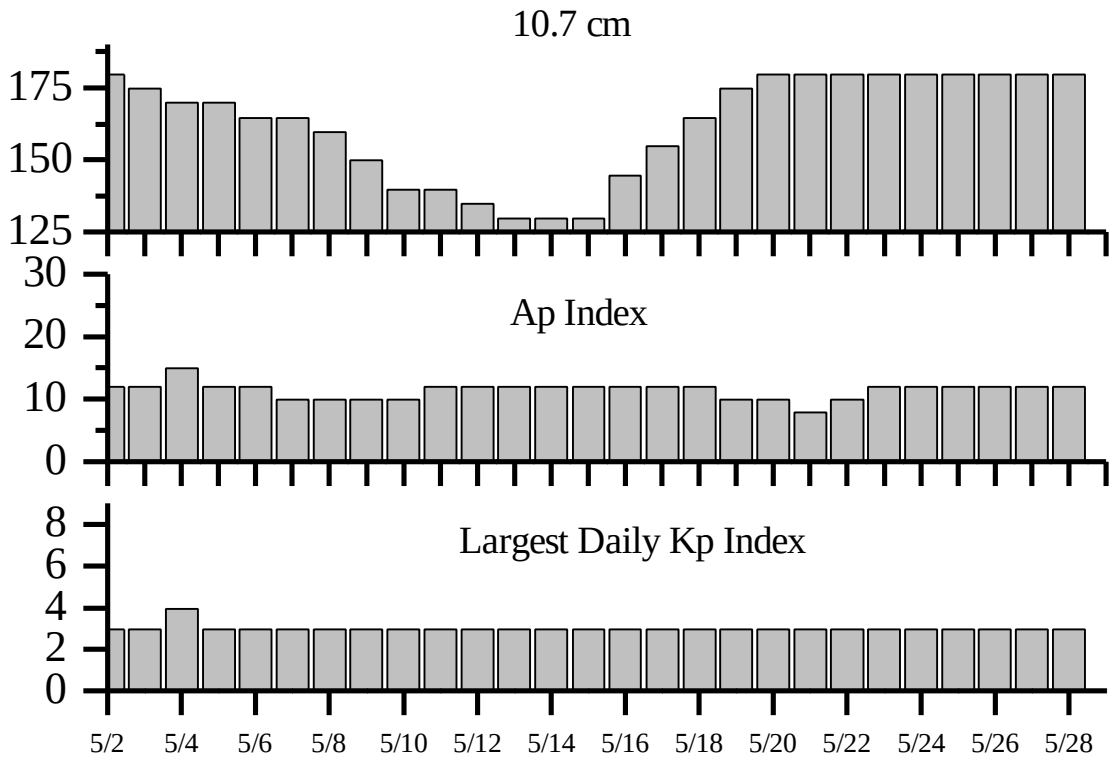
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
23 April	18	4-5-5-2-2-1-1-1	14	3-3-4-4-3-2-1-0	21	4-4-5-4-3-3-3-2
24 April	11	1-2-2-2-1-5-1-2	19	1-4-4-6-1-1-1-2	8	1-2-3-2-2-3-2-2
25 April	7	1-1-1-2-3-2-2-2	10	4-3-0-3-2-2-2-1	7	1-1-1-2-3-3-2-2
26 April	8	0-1-2-1-2-4-2-2	14	0-2-5-5-1-0-1-1	7	1-2-3-2-2-3-2-1
27 April	3	1-1-1-0-1-1-1-1	4	2-0-0-0-1-1-2-3	6	2-1-0-2-3-3-2-1
28 April	34	1-5-3-4-6-5-4-4	46	1-5-4-5-7-6-3-2	28	2-5-3-4-5-5-3-3
29 April	11	4-3-2-2-3-2-2-1	9	4-3-2-1-2-1-2-1	15	4-4-2-2-3-2-2-1

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
23 Apr 0017	5 – 245 MHz Radio Bursts	22 Apr
23 Apr 0541	K= 4 Warning	23 Apr 0545 - 1500
23 Apr 0553	K= 5 Warning	23 Apr 0555 - 1500
23 Apr 0554	K= 5 Observed	23 Apr 0300 - 0600
24 Apr 0132	4 – 245 MHz Radio Bursts	23 Apr
24 Apr 0132	245 MHz Radio Noise Storm	23 Apr
24 Apr 0600	ENDED A >=20 Observed	22 Apr 1200
25 Apr 0043	2 – 245 MHz Radio Bursts	24 Apr
25 Apr 0043	245 MHz Radio Noise Storm	24 Apr
25 Apr 1455	10cm Radio Burst 200 F.U.	25 Apr 1342
25 Apr 1457	Type II Radio Emission	25 Apr 1347
25 Apr 2113	A >=20 Watch	26 Apr
25 Apr 0045	5 – 245 MHz Radio Bursts	24 Apr
26 Apr 1330	X-Ray event M7.8/2B	26 Apr 1312
26 Apr 1340	10cm Radio Burst 360 F.U.	26 Apr 1307
26 Apr 1401	Type II Radio Emission	26 Apr 1334
26 Apr 1407	Type IV Radio Emission	26 Apr 1341
26 Apr 1410	Proton Event >10MeV >=10pfu Warning	26/2100 - 27/2100 Apr
26 Apr 2022	A >=20 Watch	29 Apr
27 Apr 0023	1 – 245 MHz Radio Bursts	26 Apr
24 Apr 0023	245 MHz Radio Noise Storm	26 Apr
27 Apr 1358	CANCELLED Proton Event >10MeV >=10pfu Warning	26/2100 - 27/2100 Apr
27 Apr 2153	A >=30 Watch	29 Apr
28 Apr 0017	4 – 245 MHz Radio Bursts	27 Apr
28 Apr 0340	Proton Event >10MeV >=10pfu Warning	28 Apr 0345 - 0600
28 Apr 0447	Protons Event >10 MeV >=10pfu	28 Apr 0430
28 Apr 0506	Sudden Impulse observed at Boulder	28 Apr 0503
28 Apr 0519	K = 5 Warning	28 Apr 0520 - 0900
28 Apr 0601	K= 5 Observed	28 Apr 0300 - 0600
28 Apr 1159	K = 4 Observed	28 Apr 0900 - 1200
28 Apr 1224	K = 4 Warning	28/1230 - 29/1500 Apr
28 Apr 1227	K = 5 Warning	28/1230 - 29/0600 Apr
28 Apr 1353	ENDED Protons Event >10 MeV >=10pfu	28 Apr 0430
28 Apr 1501	K= 4 Observed	28 Apr 1200 - 1500
28 Apr 1801	K= 5 Observed	28 Apr 1500 - 1800
28 Apr 1802	A >= 20 Observed	28 Apr 1802
28 Apr 1946	CANCELLED K= 5 Warning	28/1230 – 29/0600 Apr
28 Apr 2155	CANCELLED A >=30 Watch	29 Apr
29 Apr 1801	ENDED A >=20 Observed	28 Apr 1802

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
02 May	180	12	3	16 May	145	12	3
03	175	12	3	17	155	12	3
04	170	15	4	18	165	12	3
05	170	12	3	19	175	10	3
06	165	12	3	20	180	10	3
07	165	10	3	21	180	8	3
08	160	10	3	22	180	10	3
09	160	10	3	23	180	12	3
10	150	10	3	24	180	12	3
11	140	12	3	25	180	12	3
12	140	12	3	26	180	12	3
13	130	12	3	27	180	12	3
14	130	12	3	28	180	12	3
15	130	12	3				

Energetic Events

Date	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
	Begin	Max	½ Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
23 Apr	0119	0128	0137	M1.0	.007	1F	N18E18	9433	420	53		
23 Apr	2015	2030	2043	M4.0	.044	2N	N14E23	9433		79		
24 Apr	0533	0542	0547	M2.1	.009	1N	N18E01	9433	610	100		
24 Apr	0653	0700	0708	M3.1	.017	1F	N18E11	9433		140		
24 Apr	1238	1253	1309	M1.6	.020	1N	N19E15	9433		34		
24 Apr	1804	1812	1817	M2.3	.009	1N	N17E13	9433				
24 Apr	2214	2224	2230	M1.8	.010	1N	N17E01	9433	2400	130		
25 Apr	1339	1348	1359	M2.7	.021	2N	N18W09	9433	820	200	2	
26 Apr	1126	1312	1319	M7.8	.092	2B	N17W31	9433	320	360	2	2
27 Apr	1906	1915	1935	M1.2	.015	1F	N18W37	9433				

Flare List

Date	Time			X-ray	Optical		Rgn
	Begin	Max	End	Class.	Imp / Brtns	Location Lat CMD	
23 April	0123	0126	A0220	M1.0	1F	N18E18	9433
	0329	0333	0347	C1.3			
	0440	0450	0512	C4.1	SF	N17E21	9433
	0616	0652	0741	C2.2			
	1010	U1016	1029	C9.1	SF	N17E12	9433
	1221	1222	1248	C2.8	SF	S14W17	9431
	1532	1533	1545		SF	N16E07	9433
	1956	2026	2157	M4.0	2N	N14E23	9433
	2338	2340	2351	C3.2	SF	N16E12	9433
24 April	0019	0021	0036	C5.3	SF	N17E03	9433
	B0258	U0303	0307		SF	N17E01	9433
	0319	U0322	A0327		SF	N17E02	9433
	0349	U0350	A0402	C3.4	SF	N18E16	9433
	0536	U0542	A0609	M2.1	1N	N18E01	9433
	B0712	U0712	A0820	M3.1	1F	N18E11	9433
	1216	1220	1224	C1.4			
	1242	1252	1343	M1.6	1N	N19E15	9433
	1345	1347	1354		SF	N20E15	9433
	1806	1812	1855	M2.3	1N	N17E13	9433
	1857	1901	1907		SF	N17E12	9433
	1959	2003	2010		SF	N18E11	9433
	2120	2123	2129	C2.4	SF	N18E10	9433
	2217	2222	2314	M1.8	1N	N17E01	9433
	2347	2350	0011	C6.8	SF	N19E09	9433
25 April	0050	0053	0055		SF	N18E07	9433
	0056	0058	0104		SF	N16E01	9433
	0217	0217	0225	C1.5	SF	N18E07	9433
	0305	0311	0324	C1.9	SF	N17E05	9433

Flare List – continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
25 April	0506	0506	0524	C7.8	SF	N18E00	9433
	0806	0812	0918	C5.3	SF	N20E02	9433
	0924	0924	0929		SF	N17W08	9433
	0936	0952	0955	C4.0	SF	N17W16	9433
	0956	0957	1003		SF	N19E03	9433
	1114	1115	1117		SF	N19E02	9433
	1136	1138	1139		SF	N20E01	9433
	1143	1147	1236	C6.8	SF	N19E01	9433
	1344	1345	1420	M2.7	2N	N18W09	9433
	1425	1430	1435		SF	N19W01	9433
	1526	1543	1627	C6.6	SF	N19E00	9433
	1827	1827	1832	C2.4	SF	N15W09	9433
	1853	1900	1905		SF	N18W02	9433
	2301	2307	2315	C1.6			
26 April	0103	0108	0128	C3.4	SF	N19W08	9433
	0155	0158	0225	C3.7	SF	N19W07	9433
	0433	0433	0442		SF	N09E16	9437
	0435	0438	0449		SF	N19W10	9433
	0958	1002	1004	C2.2			
	1211	1311	1431	M7.8	2B	N17W31	9433
	1608	1611	1615		SF	N20W08	9433
	2008	2010	2014		SF	N08E53	9441
	2354	2355	0002	C4.2	SF	N18W22	9433
27 April	0106	0109	0127	C2.4	SF	N20W21	9433
	0329	0332	0432	C5.0	SF	N20W22	9433
	0652	0708	0719		SF	N10E46	9441
	0657	0657	0702	C2.1	SF	N15W42	9433
	0721	0724	0733		SF	N10E46	9441
	0834	0848	0853		SF	N19W27	9433
	0903	0904	0909		SF	N09E45	9441
	1321	1322	1326		SF	N06E43	9441
	1352	1353	1357		SF	N19W27	9433
	1403	U1409	A1426		SF	N19W28	9433
	1656	1657	1704		SF	N15W38	9433
	1909	1917	2009	M1.2	1F	N18W37	9433
	1959	2002	2007		SF	N17W23	9433
	2039	2039	2055	C1.9	SF	N20W31	9433
	2216	2221	2224		SF	N20W30	9433
	2229	2231	2234		SF	N20W33	9433
	B2309	2315	0001	C6.2	SF	N19W34	9433

Flare List – continued.

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn
28 April	0319	0342	0401	C2.1			
	0455	0501	0506	C1.7			
	0655	0657	0740	C3.1	SF	N19W37	9433
	0912	0920	A0935	C7.0	1F	N16W42	9433
	1446	1448	1456		SF	S13E71	9444
	1643	1643	1650		SF	N12W62	9433
	1703	1705	1707		SF	S13E69	9444
	1733	1735	1801		SF	N20W42	9433
	2008	2013	2015	C2.8			
	2017	2017	2024		SF	N20W43	9433
	2212	2216	2220	C1.7			
29 April	0354	0355	0401	C1.8	SF	N18W46	9433
	0405	0408	0418		SF	N23E71	9445
	0823	0828	0831	C2.1			
	0908	0930	0938	C3.0			
	1057	1101	1107	C1.9			
	1247	1249	1251		SF	N18W52	9433
	1414	1417	1422		SF	N23E70	9445
	1635	1639	1643	C2.0			
	1726	1727	1731	C1.4	SF	N19E63	9445
	1743	1745	1749	C2.4	SF	N23E67	9445
	1922	1925	1932	C2.7	SF	N25E60	9445
	2004	2046	2115	C2.6			
	2120	2125	2130		SF	N18E61	9445
	2159	2200	2207		SF	N18E61	9445
	2210	2214	2215		SF	N18E59	9445
	2323	2327	2329	C3.2			

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 9429												
14 Apr	N09E62	224	0080	02	HSX	001	A								
15 Apr	N08E50	223	0120	02	HSX	001	A								
16 Apr	N09E36	224	0090	02	HSX	001	A								
17 Apr	N08E23	224	0080	02	HAX	001	A								
18 Apr	N08E09	225	0080	02	HSX	001	A								
19 Apr	N08W04	225	0060	02	HSX	001	A								
20 Apr	N09W18	225	0050	02	HSX	001	A								
21 Apr	N08W31	225	0060	02	HSX	001	A								
22 Apr	N08W45	226	0050	02	HSX	001	A								
23 Apr	N09W58	226	0040	01	HSX	001	A								
24 Apr	N09W71	226	0030	01	AXX	001	A								
25 Apr	N08W85	226	0030	00	HRX	001	A								
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 225

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 9431												
17 Apr	S10E49	198	0010	01	AXX	002	A								
18 Apr	S11E36	198	0000	00	AXX	001	A								
19 Apr	S11E23	198	0000	00		000									
20 Apr	S12E15	192	0030	04	CSO	004	B								
21 Apr	S11E00	194	0130	05	DAO	008	B								
22 Apr	S11W15	196	0060	05	DAO	007	B								
23 Apr	S11W29	197	0020	01	HAX	002	A	1			1				
24 Apr	S10W44	199	0020	01	HSX	002	A								
25 Apr	S12W57	198	0020	01	HSX	002	A								
26 Apr	S11W71	199	0010	01	AXX	001	A								
27 Apr	S10W85	200	0000	00	AXX	001	A								
								1	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 194

Region Summary - continued.

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 9432												
18 Apr	N08E20	214	0030	04	CRO	006	B								
19 Apr	N07E06	215	0050	05	DAO	009	B								
20 Apr	N08W06	213	0050	07	DAO	011	B	1			1				
21 Apr	N08W16	210	0100	07	DAO	013	B								
22 Apr	N08W34	215	0090	07	DAO	012	B								
23 Apr	N08W47	215	0070	08	CSO	006	B								
24 Apr	N09W62	217	0060	07	CAO	003	B								
25 Apr	N08W75	216	0050	07	CSO	003	B								
26 Apr	N08W86	214	0030	01	HRX	001	A								
								1	0	0	1	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		215													
			Region 9433												
18 Apr	N14E74	160	0150	06	DAO	002	B								
19 Apr	N17E64	157	0590	19	FHO	017	B	2			3				
20 Apr	N17E52	155	0700	16	FHO	017	BG	2	2		1	3			
21 Apr	N16E40	154	0790	22	FKI	035	BG	4			5				
22 Apr	N17E26	155	0760	19	FKI	047	BGD	8	1		9	1			
23 Apr	N17E14	154	0880	21	FKI	048	BGD	3	2		4	1	1		
24 Apr	N17E02	153	1000	23	FKI	076	BGD	4	5		9	5			
25 Apr	N16W15	156	1070	25	FKI	082	BGD	8	1		16	1	1		
26 Apr	N17W25	153	0890	25	FKI	064	BGD	3	1		5	1	1		
27 Apr	N17W38	153	0910	24	FKI	045	BGD	5	1		12	1			
28 Apr	N17W50	152	0780	23	FKI	039	BGD	2			4	1			
29 Apr	N18W63	152	0780	25	FKI	030	BGD	1			2				
								42	13	0	70	1	3	0	0
Still on Disk.															
Absolute heliographic longitude:		153													
			Region 9434												
19 Apr	N19W23	244	0050	04	DAO	004	B								
20 Apr	N19W38	245	0030	05	DSO	003	B								
21 Apr	N20W51	245	0020	04	CSO	002	B								
22 Apr	N17W67	248	0010	00	AXX	001	A								
23 Apr	N17W80	248													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		244													

Region Summary - continued.

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 9435												
19 Apr	S21E28	193	0020	03	CSO	004	B								
20 Apr	S20E14	193	0030	04	DAO	007	B								
21 Apr	S20E01	193	0210	09	DAO	015	B				1				
22 Apr	S20W12	193	0250	10	DAO	014	B								
23 Apr	S19W26	194	0220	09	DAO	008	B								
24 Apr	S19W39	194	0200	08	DSO	008	B								
25 Apr	S21W51	192	0180	09	DAO	005	B								
26 Apr	S21W65	193	0180	07	DAO	004	B								
27 Apr	S20W80	195	0160	06	CAO	003	B								
28 Apr	S20W92	194	0100	02	HAX	001	A								
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 193

			Region 9436												
21 Apr	S11E72	122	0070	02	HSX	001	A								
22 Apr	S10E59	122	0100	02	HSX	001	A								
23 Apr	S12E46	122	0130	06	DSO	004	B								
24 Apr	S11E32	123	0150	05	CSO	003	B								
25 Apr	S10E20	121	0120	02	HSX	001	A								
26 Apr	S10E07	121	0160	02	HSX	001	A								
27 Apr	S10W06	121	0160	02	HSX	001	A								
28 Apr	S10W19	121	0140	02	HAX	001	A								
29 Apr	S09W33	122	0110	02	HSX	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 121

			Region 9437												
21 Apr	N08E76	118	0050	02	HSX	001	A								
22 Apr	N10E61	120	0060	01	HAX	001	A								
23 Apr	N09E48	120	0060	02	HAX	001	A								
24 Apr	N09E34	121	0050	02	HSX	001	A								
25 Apr	N08E19	122	0050	04	CAO	007	B								
26 Apr	N09E07	121	0040	05	CSO	009	B				1				
27 Apr	N09W05	120	0030	03	CAO	005	B								
28 Apr	N10W19	121	0020	02	CSO	002	B								
29 Apr	N10W32	121	0010	01	AXX	002	A								
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 120

Region Summary - continued.

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
	Region 9438														
24 Apr	S13E22	133	0010	01	AXX	001	A								
25 Apr	S13E09	133													
26 Apr	S13W04	133													
27 Apr	S13W17	133													
28 Apr	S12W30	133													
29 Apr	S12W42	131													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		133													
	Region 9439														
25 Apr	S22W28	169	0010	00	AXX	001	A								
26 Apr	S21W45	173	0020	03	CSO	002	B								
27 Apr	S20W55	170	0020	01	HRX	001	A								
28 Apr	S23W68	170	0030	02	HRX	002	A								
29 Apr	S23W81	170													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		169													
	Region 9440														
26 Apr	N07E18	110	0010	03	BXO	006	B								
27 Apr	N08E05	110	0030	04	DRO	006	B								
28 Apr	N08W08	110	0030	04	DAO	004	B								
29 Apr	N08W21	110													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		110													
	Region 9441														
26 Apr	N08E51	077	0030	04	CSO	004	B				1				
27 Apr	N08E38	077	0150	07	DAO	015	B				4				
28 Apr	N07E23	079	0190	07	DAO	016	B								
29 Apr	N07E11	078	0190	10	DAI	028	B								
								0	0	0	5	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		078													

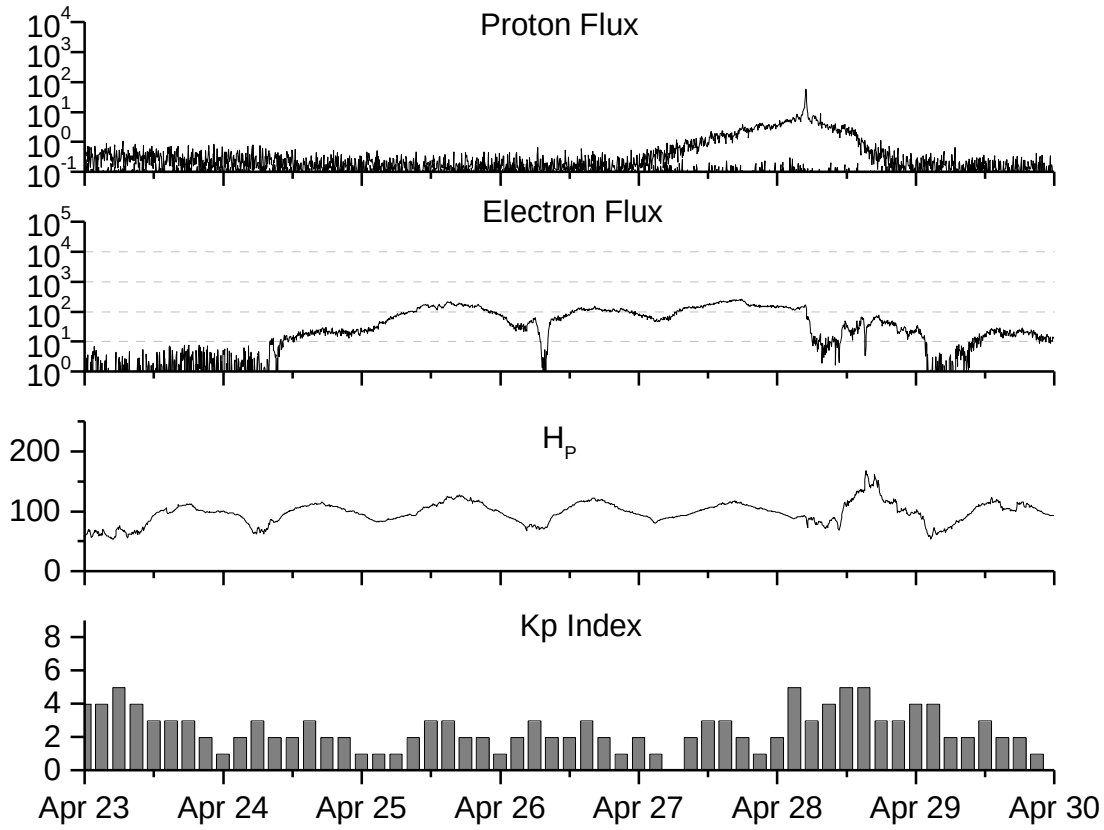
Region Summary - continued.

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
	Region 9442														
26 Apr	N28E59	069	0040	02	HSX	001	A								
27 Apr	N28E47	068	0060	01	HSX	001	A								
28 Apr	N28E34	068	0070	02	HAX	001	A								
29 Apr	N28E22	067	0060	01	HSX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		067													
	Region 9443														
27 Apr	S10E21	094	0010	03	BXO	003	B								
28 Apr	S10E08	094													
29 Apr	S10W05	094													
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		094													
	Region 9444														
28 Apr	S11E67	035	0060	02	HSX	003	A				2				
29 Apr	S11E52	037	0050	05	CSO	006	B								
								0	0	0	2	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		037													
	Region 9445														
28 Apr	N23E76	026	0060	05	CAO	004	B								
29 Apr	N24E61	028	0190	10	DAO	010	B	3			8				
								3	0	0	8	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		028													
	Region 9446														
29 Apr	S05W22	111	0010	03	CRO	003	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		111													

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

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		*Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
					1999				
April	92.9	63.7	0.69	123.8	85.5	117.2	145.8	12	12.2
May	140.5	106.4	0.76	131.7	90.5	148.6	149.9	08	12.4
June	208.3	137.7	0.66	136.0	93.1	169.8	152.9	07	12.4
July	169.2	113.5	0.67	138.0	94.3	165.6	154.4	10	12.6
August	136.1	93.7	0.69	142.8	97.5	170.8	156.3	15	12.9
September	107.4	71.5	0.67	150.0	102.3	135.7	161.0	19	12.8
October	167.7	116.7	0.70	158.5	107.8	164.8	167.2	19	12.7
November	199.3	133.2	0.67	164.7	110.0	191.5	171.5	14	13.1
December	123.5	86.4	0.69	165.9	111.1	169.8	173.4	10	13.8
					2000				
January	140.8	90.1	0.64	168.0	112.9	158.1	175.5	13	14.5
February	161.9	112.9	0.70	172.1	116.7	173.2	176.8	15	15.0
March	203.6	138.5	0.68	175.4	119.9	208.2	178.4	09	15.0
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72			167.7		18	
November	149.9	106.5	0.71			178.8		17	
December	146.4	104.5	0.71			173.6		08	
					2001				
January	142.7	95.1	0.67			166.7		08	
February	131.0	80.1	0.61			147.3		06	
March	166.7	114.2	0.69			177.7		17	

NOTE: All smoothed values after December 1999 and monthly values after June 2000 are preliminary estimates. The lowest smoothed sunspot index 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. *After June 1991, 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 23 April 2001

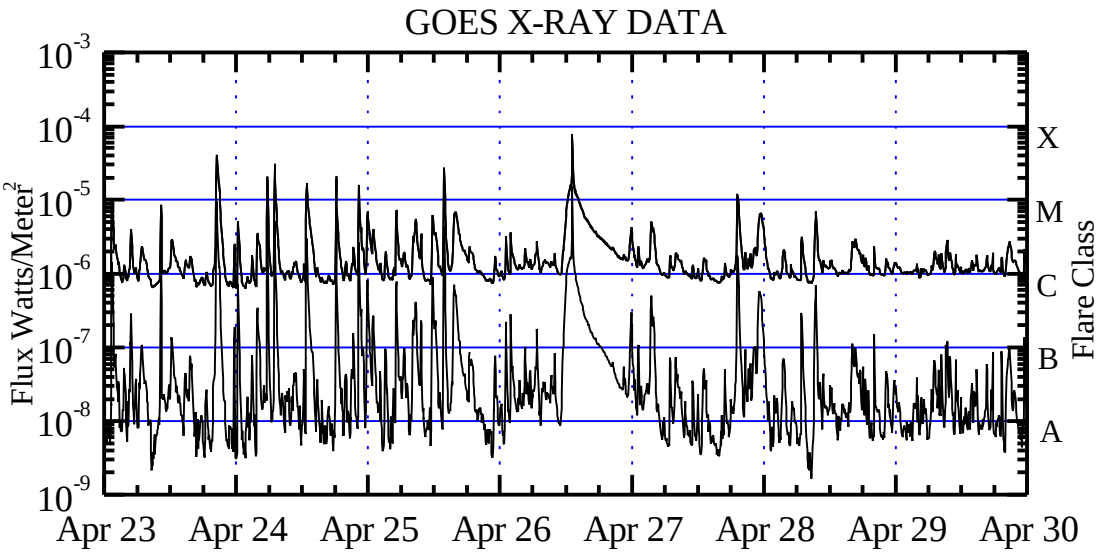
Protons plot contains the five-minute averaged integral proton flux (protons/cm^2–sec –sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

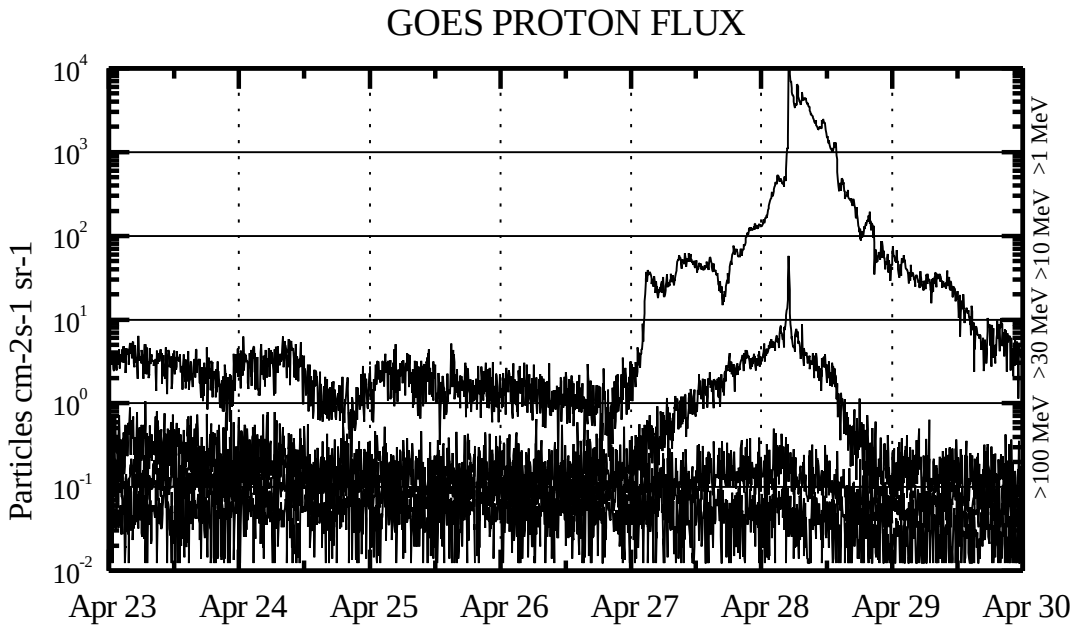
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm^2 –sec –sr) with energies greater than 2 MeV at GOES-8.

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp 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 Kp 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 Kp are " global " parameters that are applicable to a first order approximation over large areas. Hparallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





W*eekly GOES Satellite X-ray and Proton Plots*

X-ray plot contains five-minute averaged x-ray flux (watts/m$^{2)}$ as measured by GOES 8 and 10 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.

Proton plot contains the five-minute averaged integral proton flux (protons/cm^2 –sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.

Cosmic-Ray Ground-Level Events

Space Environment Center

March 2001
(Month 54)

Preliminary data