

Space Weather Highlights 04 - 10 November 2002

**SWO PRF 1419
12 November 2002**

Solar activity was at low to moderate levels. Moderate activity occurred on 09-10 November. The largest event was an M4 flare on 09 November from Region 180 (S10, L=308, class/area Fkc/630 on 09 November) with an associated Type II (707 km/s) and Type IV radio sweep. A partial halo CME was observed with this event in SOHO/LASCO C2 and C3 imagery. For flare times and magnitudes please refer to the Optical Flare and Energetic Flare lists. Region 180 has been the dominant region on the disk but entered a decay phase on 10 November. On 07 November, three distinct delta configurations were observed and by 10 November only one delta configuration remained in the large leader spot. Region 191 (S18, L=202, class/area Ekc/590 on 10 November) rotated onto the visible disk on 08 November and has grown rapidly into a moderate sized magnetic beta spot group. Region 191 has produced only C-class activity as of the close of the period.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Solar wind velocities gradually increased from 04 November to 06 November due to coronal hole effects. The coronal hole also produced a slightly negative Bz component. By 08 November, solar wind velocity had decreased below 400 km/s. On 09 November, at approximately 09/1740 UTC the ACE spacecraft observed a weak transient shock.

A greater than 10 MeV proton event associated with the M4 flare mentioned above began at 09/1920 UTC, reached a peak value of 404 pfu at 10/0540 UTC, and was still in progress at the close of the period.

The greater than 2 MeV electron flux at geo-synchronous orbit reached high levels. High levels were observed on 05-10 November. Moderate levels were observed on 04 November.

The geomagnetic field was quiet to active during the summary period. Residual coronal hole effects, on 04-07 November, resulted in unsettled to active conditions. A weak transient shock arrived late on 09 November, producing a 6 nT sudden impulse at 09/1751 UTC that was recorded on the Boulder Magnetometer. Unsettled to active conditions, with one period of isolated minor storm, were the result of the shock arrival.

Space Weather Outlook 13 November - 09 December 2002

Solar activity is expected be low to moderate. Region 191 has the potential for further development and could produce M-class activity. Old Region 162 (N26, L=121) is due to return to the visible disk on early in the period.

There is a slight chance of a greater than 10 MeV proton event during the forecast period.

The greater than 2 MeV electron flux at geo-synchronous orbit is expected to reach event threshold on 22-27 November and again on 02-07 December due to coronal hole effects.

The geomagnetic field is expected to be at quiet to minor storm levels. Minor storm levels are possible on 13 November due to a CME shock arrival. Active to minor storm conditions are possible on 15-17 November, 20-23 November and again on 29 November - 02 December due to a recurring coronal holes.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
04 November	177	166	1540	B8.3	8	0	0	12	0	0	0	0
05 November	183	175	1660	B7.3	11	0	0	14	0	0	0	0
06 November	185	234	1550	B6.7	12	0	0	19	0	0	0	0
07 November	190	259	1430	B7.2	2	0	0	13	0	0	0	0
08 November	189	252	1510	B8.4	8	0	0	8	1	0	0	0
09 November	191	174	1730	C1.2	6	1	0	14	0	1	0	0
10 November	191	219	1560	C1.2	17	1	0	8	0	1	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 November	1.3E+6	3.5E+4	2.3E+3		1.7E+7
05 November	6.9E+5	1.7E+4	2.0E+3		5.9E+7	
06 November	1.1E+6	1.2E+4	1.9E+3		7.8E+7	
07 November	2.8E+5	1.1E+4	2.2E+3		1.2E+8	
08 November	9.5E+4	1.1E+4	2.2E+3		6.5E+7	
09 November	4.2E+6	1.0E+6	2.6E+3		1.6E+8	
10 November	7.9E+7	1.0E+7	3.6E+3		2.0E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 November	11	3-3-2-3-2-2-2-3	33	3-3-5-5-5-5-3-4	21
05 November	15	2-4-3-3-3-3-2-3	43	4-4-6-6-5-5-3-3	19	3-4-4-4-4-3-3-3
06 November	12	3-2-3-2-3-2-3-3	38	3-3-5-6-6-4-4-3	19	4-3-3-4-4-4-4-3
07 November	10	4-3-2-2-2-2-2-1	21	3-2-3-5-5-3-3-1	14	4-3-3-3-3-3-3-3
08 November	3	1-1-0-1-1-1-2-0	6	1-1-3-3-3-0-0-0	8	2-2-2-2-3-2-3-2
09 November	3	0-0-1-0-1-1-2-2	2	0-0-0-2-0-0-2-1	9	2-2-1-2-2-3-3-3
10 November	12	2-4-4-1-2-2-1-2	11	2-4-4-2-2-2-1-1	15	3-4-5-2-3-3-2-2

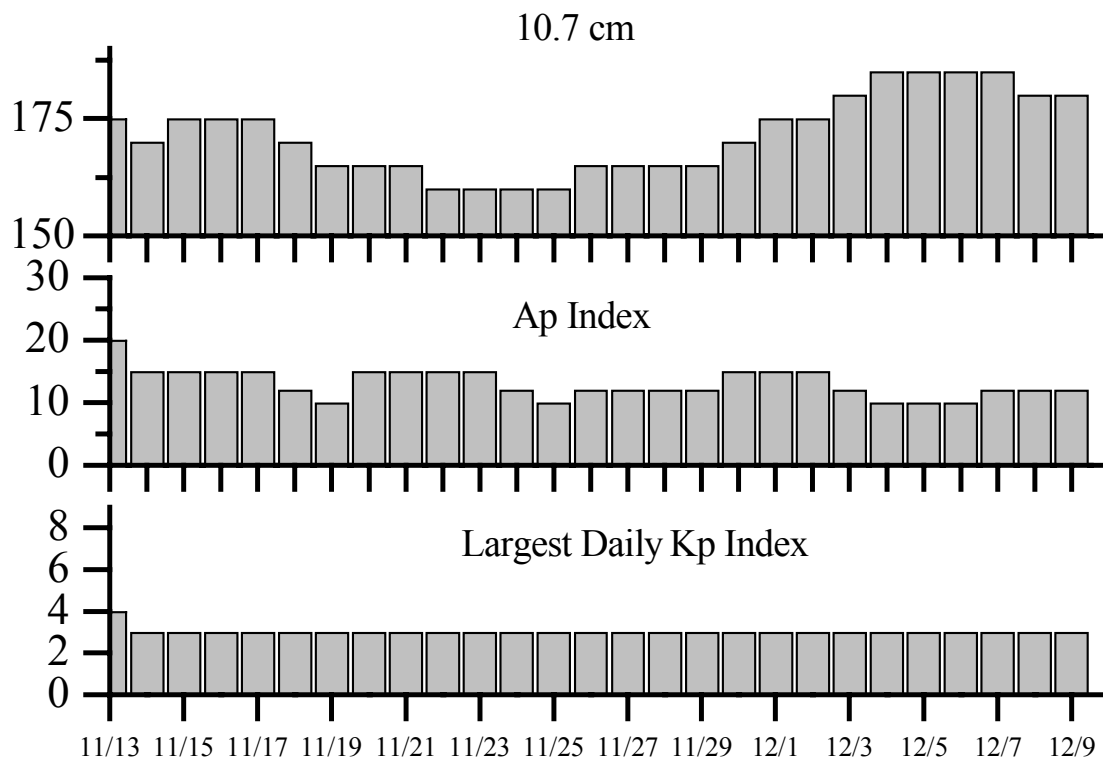


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
04 Nov 0008	7 - 245 MHz Radio Bursts	03 Nov
04 Nov 0008	1 - 245 Radio Noise Storms	03 Nov
04 Nov 1459	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 -04 Nov 2359
04 Nov 2315	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 - 05 Nov 1500
05 Nov 0030	1 - 245 Radio Noise Storms	04 Nov
05 Nov 0448	WARNING: Geomagnetic K= 5 expected	05 Nov 0450 -1500
05 Nov 1340	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	05 Nov 1315
05 Nov 1500	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 -05 Nov 2359
05 Nov 2322	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 - 06 Nov 1500
06 Nov 0051	11 - 245 MHz Radio Bursts	05 Nov
06 Nov 0051	1 - 245 Radio Noise Storms	05 Nov
06 Nov 0609	ALERT: Type II Radio Emission	06 Nov 0538
06 Nov 1358	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	06 Nov 1335
06 Nov 1500	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 -06 Nov 2359
06 Nov 2354	EXTENDED WARNING: Geomagnetic K= 4 expected	02 Nov 0839 -07Nov 1500
07 Nov 0029	10 - 245 MHz Radio Bursts	06 Nov
07 Nov 0029	1 - 245 Radio Noise Storms	06 Nov
07 Nov 1018	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	07 Nov 0955
08 Nov 0019	3 - 245 MHz Radio Bursts	07 Nov
08 Nov 0019	1 - 245 Radio Noise Storms	07 Nov
08 Nov 1446	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	08 Nov 1425
09 Nov 0031	1 - 245 MHz Radio Burst	08 Nov
09 Nov 0526	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	09 Nov 0510
09 Nov 1332	ALERT: Type IV Radio Emission	09 Nov 1309
09 Nov 1358	ALERT: Type II Radio Emission	09 Nov 1317
09 Nov 1404	SUMMARY: 10cm Radio Burst	09 Nov 1310
09 Nov 1816	SUMMARY: Geomagnetic Sudden Impulse	09 Nov 1751
09 Nov 1831	WARNING: Proton 10MeV Integral Flux above 10pfu	09 Nov 1900 -10 Nov 2359
09 Nov 1938	ALERT: Proton Event 10MeV Integral Flux exceeded 10pfu	09 Nov 1920
09 Nov 2137	WATCH: Geomagnetic $A \geq 20$ or greater predicted	12 Nov
09 Nov 2326	ALERT: Proton Event 10MeV Integral Flux exceeded 100pfu	09 Nov 2300
10 Nov 0328	SUMMARY: 10cm Radio Burst	10 Nov 0307
10 Nov 0349	ALERT: Type II Radio Emission	10 Nov 0314
10 Nov 0554	WARNING: Geomagnetic K-index of 4 expected	10 Nov 0554 -1500
10 Nov 0555	ALERT: Geomagnetic K= 4	10 Nov 0553
10 Nov 0556	WARNING: Geomagnetic K-index of 5 expected	10 Nov 0556 -1500
10 Nov 0603	ALERT: Geomagnetic K-index of 5	10 Nov 0559
10 Nov 0615	ALERT: Electron 2MeV Integral Flux exceeded 1000pfu	10 Nov 0550
10 Nov 1819	SUMMARY: Proton Event 10MeV Integral Flux > 100pfu	09 Nov 2300 - 10 Nov 0540
10 Nov 2242	EXTENDED WARNING: Proton 10MeV Integral Flux > 10pfu	09 Nov 1900 -11 Nov 2359



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 Nov	175	20	4	27 Nov	165	12	3
14	170	15	3	28	165	12	3
15	175	15	3	29	165	12	3
16	175	15	3	30	170	15	3
17	175	15	3	01 Dec	175	15	3
18	170	12	3	02	175	15	3
19	165	10	3	03	180	12	3
20	165	15	3	04	185	10	3
21	165	15	3	05	185	10	3
22	160	15	3	06	185	10	3
23	160	15	3	07	185	12	3
24	160	12	3	08	180	12	3
25	160	10	3	09	180	12	3
26	165	12	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	$\frac{1}{2}$	Class	Integ Flux	Imp/ Brtns	Location		Radio Flux		Intensity	
			Max				Lat	CMD	Rgn	#	245	2695
09 Nov	1308	1323	1336	M4.6	.048	2b	S12W29	180	350	760	2	2
10 Nov	0304	0321	0335	M2.4	.030	2n	S12W37	180	72	400	3	

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Lat	CMD	
04 November	0122	0127	0136		Sf	S09E37	180	
	0200	0204	0206	C1.7				
	0324	0330	0346	C3.7	Sf	N14E19	177	
	0511	0515	0535		Sf	S10E33	180	
	0642	0646	0650		Sf	S10E32	180	
	0716	0728	0732		Sf	S11E33	180	
	0733	0735	0738		Sf	S10E36	180	
	0752	0755	0809		Sf	S10E31	180	
	0837	0838	0846		Sf	S10E31	180	
	0930	0931	0938		Sf	S10E30	180	
	B1125	U1127	1136	C3.7	Sf	S08E31	180	
	1625	1634	1708		Sf	N16E03	177	
	B1811	U1822	1906	C4.4	Sf	S09E26	180	
	1939	2024	2046	C2.1				
	2154	2158	2203	C2.1				
2233	2243	2249	C5.4					
2347	2352	2358	C2.1					
05 November	0330	0331	0425	C1.2	Sf	S12E29	180	
	0449	0456	0457	C1.0	Sf	S10E19	180	
	0458	0511	0514		Sf	S10E19	180	
	0552	0554	0557	C1.2	Sf	N19W01	177	
	0945	0947	A0949	C1.6	Sf	N13E02	177	
	1300	1301	1305	C7.5	Sf	N20W04	177	
	1344	1350	1356		Sf	S09E15	180	
	1400	1401	1406		Sf	S10E15	180	
	1609	1610	1620	C6.4	Sn	N20W07	177	
	1636	1638	1704	C1.4	Sf	S11E15	180	
	1818	1822	1835	C2.7	Sf	S14E57	185	
	2043	2044	2054	C2.8	Sf	N21W09	177	
	2103	2109	2136	C3.4	Sf	N15W06	177	
2152	2153	2219	C9.5	Sf	N15W07	177		
06 November	0509	0528	0559	C7.2	Sf	S13E13	180	
	0801	0812	0819		Sf	N17W15	177	
	0833	0833	0839		Sf	S08E02	180	
	0838	0838	0847		Sf	S04W10	181	
	1159	1207	1214	C1.9				



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
06 November	1434	1438	1452	C2.7	Sf	N11E26	188	
	1444	1446	1456	C2.6	Sf	S08E03	180	
	1532	1543	1554		Sf	N11E25	188	
	1642	1643	1648	C3.7	Sf	S08E06	180	
	1646	1647	1654		Sf	N16W17	177	
	1756	1758	1807		Sf	S09E02	180	
	1818	1819	1822		Sf	S08E01	180	
	1832	1835	1846	C1.6	Sf	N12E24	188	
	1944	1944	1952	C2.2	Sf	N06E10	187	
	1945	1946	2024		Sf	N11E22	188	
	2018	2018	2023	C2.4	Sf	N12E23	188	
	2031	2034	2036	C1.1				
	2107	2110	2115	C1.2				
	2140	2140	2144	C4.5	Sf	S08W04	180	
	2154	2156	2158		Sf	S08W02	180	
	2311	2320	2341	C7.3	Sf	N16W21	177	
	2320	2320	2329		Sf	N11E21	188	
	07 November	0125	0125	0137		Sf	N09E20	188
		0343	0344	0351		Sf	S10W05	180
		0525	0533	0601		Sf	S10W06	180
0622		0807	0830		Sf	S10W07	180	
0626		0633	0654	C2.5	Sf	N17W30	177	
0827		0827	0841		Sf	N10E16	188	
0903		0904	0908	C2.8	Sf	S10W11	180	
1140		1145	1152		Sf	S12W16	180	
1156		1159	1208		Sf	S08W07	180	
1328		1329	1335		Sf	S22E62	0	
1350		1354	1359		Sf	S22E62	0	
1427		1448	1452		Sf	S22E60	0	
2034		2034	2045		Sf	S06W16	180	
08 November		0203	0204	0224		Sf	S08W19	180
	0502	0504	0518	C1.3	Sf	S07W22	180	
	0820	0848	0933	C2.1	Sf	S10W19	180	
	1001	1009	1015	C2.7				
	1059	1059	1109	C1.9	Sf	S08W26	180	
	1222	1223	1231	C5.8	Sf	S09W26	180	
	1351	1355	1358	C2.0				
	1427	1428	1433		Sf	S08W27	180	
	1447	1448	1456		Sf	S09W27	180	
	1457	1458	1502		Sf	S08W27	180	
	1802	1818	1903	C7.4	1f	S12W19	180	
2216	2220	2224	C1.3					



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
09 November	0422	0426	0430	C1.6				
	0944	0954	1003	C4.7				
	1148	1148	1218	C6.3	Sf	S11W36	180	
	1309	1322	1428	M4.6	2b	S12W29	180	
	1350	1402	1428		Sf	N10W14	188	
	B1416	U1416	1422		Sf	S07W32	180	
	1522	1526	1530	C4.1	Sf	S10W38	180	
	1533	1551	1604		Sf	N15W81	175	
	1622	1622	1625		Sf	S12W32	180	
	1742	1744	1748	C7.9	Sf	S19E70	191	
	1817	1828	1834		Sf	S11W41	180	
	1835	1835	1838		Sf	S19E64	191	
	1919	1920	1925		Sf	S11W42	180	
	1956	2004	2025		Sf	S10W42	180	
	2012	2013	2016		Sf	S17E67	191	
	2034	2035	2045		Sf	S18E67	191	
	2109	2117	2123		Sf	S10W44	180	
	2312	2319	2324	C5.8				
	10 November	0117	0133	0141	C5.5			
		0307	0314	0358	M2.4	2n	S12W37	180
0528		0533	0541	C2.3				
0743		0743	0746		Sf	S10W49	180	
0835		0928	1016	C5.9				
0939		0939	0943		Sf	S17E60	191	
1103		1107	1112	C5.5				
1136		1138	1149	C5.1	Sf	S18E60	191	
1143		1217	1242	C5.4	Sf	S08W48	180	
1149		1152	1155	C3.9				
1335		1346	1404	C4.5				
1419		1419	1424		Sf	S12W43	180	
1458		1459	1507		Sf	S19E55	191	
1459		1504	1531	C3.4	Sf	S10W54	180	
1508		1509	1515		Sf	S14E38	191	
1556		1605	1613	C2.6				
1640		1655	1702	C3.3				
1756		1804	1817	C1.9				
1844		1856	1908	C2.1				
1949		1958	2006	C1.6				
2026	2033	2043	C1.5					
2118	2129	2205	C2.3					
2339	2351	0011	C3.2					



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

Region 167

23 Oct	N18E75	056	0060	01	Hax	001	A										
24 Oct	N17E64	054	0040	02	Hsx	001	A										
25 Oct	N17E50	054	0040	02	Hax	001	A										
26 Oct	N18E36	055	0040	03	Cso	002	B										
27 Oct	N18E24	054	0020	01	Hsx	001	A										
28 Oct	N17E10	055	0040	01	Hsx	002	A										
29 Oct	N17W03	055	0060	04	Cso	007	B										
30 Oct	N16W17	055	0050	04	Cso	004	B										
31 Oct	N16W30	055	0030	03	Cso	002	B										
01 Nov	N17W42	054	0020	02	Hsx	002	A										
02 Nov	N17W57	056	0020	01	Hsx	001	A										
03 Nov	N18W70	056	0010	01	Axx	001	A										
04 Nov	N18W83	056															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 055

Region 169

24 Oct	S19E75	043	0110	04	Dso	002	B										
25 Oct	S19E59	043	0090	05	Dao	002	B										
26 Oct	S19E47	044	0100	04	Dso	002	B										
27 Oct	S18E33	045	0050	03	Dso	002	B										
28 Oct	S20E21	044	0050	07	Dao	009	B										
29 Oct	S20E07	045	0060	07	Dao	009	B										
30 Oct	S20W05	043	0060	07	Dso	007	B										
31 Oct	S19W20	045	0030	04	Dso	003	B										
01 Nov	S19W32	044	0010	01	Axx	002	A										
02 Nov	S19W45	044															
03 Nov	S19W58	044															
04 Nov	S19W71	044															
05 Nov	S19W84	044															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 043



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

Region 171

25 Oct	N10E76	028	0060	02	Hax	001	A										
26 Oct	N10E64	027	0060	02	Hsx	001	A										
27 Oct	N11E52	026	0060	02	Hsx	001	A										
28 Oct	N10E39	026	0070	02	Hax	003	A										
29 Oct	N11E25	027	0070	02	Hax	002	A										
30 Oct	N11E12	026	0050	02	Hax	002	A										
31 Oct	N10W01	026	0040	01	Hsx	001	A										
01 Nov	N10W14	026	0020	01	Hsx	001	A										
02 Nov	N11W28	027	0010	01	Hsx	002	A										
03 Nov	N11W41	027															
04 Nov	N11W54	027															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 026

Region 174

29 Oct	S25E55	357	0070	03	Cao	002	B										
30 Oct	S24E42	356	0080	07	Cso	005	B										
31 Oct	S25E32	353	0060	10	Cso	006	B										
01 Nov	S26E18	354	0040	08	Dao	008	B										
02 Nov	S26E02	357	0030	05	Dso	006	B										
03 Nov	S26W08	354	0020	03	Bxo	004	B										
04 Nov	S26W21	354															
05 Nov	S26W34	354															
06 Nov	S26W47	354															
07 Nov	S26W60	354															
08 Nov	S26W73	354															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 357



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares							
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3

Region 175

29 Oct	N15E57	355	0050	06	Cso	005	B	3			8						
30 Oct	N16E44	354	0120	07	Dao	010	B				1						
31 Oct	N16E29	356	0170	07	Dso	006	B	2	1								
01 Nov	N15E18	354	0160	15	Eao	015	B	2			1						
02 Nov	N14E04	355	0120	14	Eso	014	B										
03 Nov	N15W09	355	0110	13	Eao	016	B										
04 Nov	N15W22	355	0060	08	Dso	003	B										
05 Nov	N15W36	355	0070	10	Dso	004	B										
06 Nov	N14W54	360	0060	06	Cao	005	B										
07 Nov	N14W70	003	0030	02	Hsx	002	A										
08 Nov	N15W82	002	0040	01	Hsx	001	A										
								7	1	0	10	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 355

Region 176

29 Oct	N12E75	337	0090	02	Hsx	001	A				1					1	
30 Oct	N12E64	334	0130	02	Hax	001	A										
31 Oct	N11E50	335	0110	02	Hsx	001	A										
01 Nov	N10E37	335	0120	02	Hsx	002	A										
02 Nov	N10E24	335	0090	02	Cso	002	B										
03 Nov	N10E11	335	0110	03	Cso	003	B										
04 Nov	N10W02	335	0140	03	Cso	002	B										
05 Nov	N10W15	335	0110	02	Hsx	001	A										
06 Nov	N10W28	334	0130	02	Hsx	001	A										
07 Nov	N10W42	335	0120	02	Hsx	001	A										
08 Nov	N10W55	335	0140	02	Hsx	001	A										
09 Nov	N10W68	335	0250	02	Hsx	001	A										
10 Nov	N09W81	334	0110	03	Hsx	001	A										
								0	0	0	1	0	0	1	0		

Still on Disk.

Absolute heliographic longitude: 335



Region Summary - continued.

Date	Location		Sunspot Characteristics				Flares								
	(° Lat ° CMD)	Helio Lon	Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
							C	M	X	S	1	2	3	4	
<i>Region 177</i>															
30 Oct	N16E69	329	0060	02	Hsx	001	A					2			
31 Oct	N16E57	328	0160	10	Dao	008	B	1			1				
01 Nov	N15E43	329	0310	10	Dki	015	Bg	1			1				
02 Nov	N16E31	328	0370	11	Eki	018	Bg	1			1				
03 Nov	N16E18	328	0360	10	Dki	023	Bg	2	1		2	1			
04 Nov	N16E05	328	0340	08	Dki	014	Bg	1			2				
05 Nov	N16W09	328	0390	08	Dki	017	Bg	7			7				
06 Nov	N17W22	328	0300	09	Dki	027	Bg	1			3				
07 Nov	N18W36	329	0210	07	Dao	014	B	1			1				
08 Nov	N18W50	330	0220	05	Dso	008	B								
09 Nov	N18W63	330	0160	04	Dao	005	B								
10 Nov	N17W76	329	0100	04	Dao	006	B								
								15	1	0	20	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 328

<i>Region 178</i>															
31 Oct	N00W15	040	0040	04	Dao	004	B								
01 Nov	N01W30	042	0070	06	Dao	010	B								
02 Nov	N01W45	044	0100	07	Dao	010	B								
03 Nov	N02W58	044	0110	07	Dao	007	B								
04 Nov	N02W37	046	0120	02	Hax	001	A								
05 Nov	N02W87	046	0090	02	Hax	001	A								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 040

<i>Region 179</i>															
01 Nov	N02E72	300	0030	02	Cso	002	B								
02 Nov	N02E56	303	0030	01	Hsx	001	A								
03 Nov	N02E43	303	0020	01	Hsx	001	A								
04 Nov	N02E30	303	0010	03	Bxo	002	B								
05 Nov	N02E17	302	0010	01	Axx	001	A								
06 Nov	N03E02	304	0010	01	Axx	002	A								
07 Nov	S01W08	301	0010	01	Axx	002	A								
08 Nov	S01W21	301													
09 Nov	S01W34	301													
10 Nov	S01W47	301													
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 304



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 180</i>																		
01 Nov	S11E70	302	0090	03	Hsx	001	A											
02 Nov	S10E57	302	0170	05	Dso	003	B	2				1	1					
03 Nov	S10E43	303	0150	08	Dao	012	Bg	2				5						
04 Nov	S10E30	303	0400	13	Eki	024	Bg	2				10						
05 Nov	S10E17	303	0530	15	Eki	045	Bgd	3				6						
06 Nov	S10W01	307	0560	16	Fkc	053	Bgd	4				8						
07 Nov	S10W14	307	0590	18	Fkc	066	Bgd	1				7						
08 Nov	S10W28	308	0600	17	Fkc	058	Bgd	5				8	1					
09 Nov	S10W41	308	0630	18	Fkc	038	Bgd	2	1			8		1				
10 Nov	S11W55	308	0460	18	Fki	037	Bgd	2	1			4		1				
								23	2	0	57	2	2	0	0			

Still on Disk.

Absolute heliographic longitude: 307

<i>Region 181</i>																		
02 Nov	S06E42	317	0030	08	Dso	008	B											
03 Nov	S07E31	315	0040	07	Dso	009	B											
04 Nov	S07E18	315	0080	07	Dso	011	B											
05 Nov	S07E04	315																
06 Nov	S07W09	315										1						
07 Nov	S07W22	315																
08 Nov	S07W35	315																
09 Nov	S07W48	315																
10 Nov	S07W61	315																
								0	0	0	1	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 315

<i>Region 182</i>																		
02 Nov	S17E68	291	0080	07	Dso	002	B											
03 Nov	S17E56	290	0130	07	Dso	003	B											
04 Nov	S17E43	290	0110	05	Dso	002	B											
05 Nov	S17E29	290	0110	06	Dao	004	B											
06 Nov	S18E16	290	0100	05	Cso	005	B											
07 Nov	S18E02	291	0070	02	Hsx	001	A											
08 Nov	S18W11	291	0070	01	Hsx	001	A											
09 Nov	S18W24	291	0060	02	Hsx	001	A											
10 Nov	S19W37	290	0050	02	Hsx	001	A											
								0	0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 291



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

Region 183

03 Nov	N19W24	010	0010	03	Bxo	003	B											
04 Nov	N19W37	010	0020	03	Bxo	002	B											
05 Nov	N19W50	010																
06 Nov	N19W63	010																
07 Nov	N19W76	010																
										0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 010

Region 184

03 Nov	S06E51	295	0010	01	Axx	001	A											
04 Nov	S06E38	295																
05 Nov	S06E25	295																
06 Nov	S06E12	295																
07 Nov	S06W01	295																
08 Nov	S05W15	295	0010	02	Axx	003	A											
09 Nov	S05W28	295																
10 Nov	S05W41	295																
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 295

Region 185

03 Nov	S12E77	269	0200	03	Hsx	004	A											
04 Nov	S12E64	269	0260	07	Cko	005	B											
05 Nov	S12E50	269	0310	06	Dko	009	B	1			1							
06 Nov	S13E36	270	0280	09	Dko	014	B											
07 Nov	S12E22	271	0190	08	Dao	019	B											
08 Nov	S12E10	270	0170	09	Dao	016	B											
09 Nov	S13W02	269	0160	07	Cao	012	B											
10 Nov	S13W16	269	0160	08	Dai	025	B											
										1	0	0	1	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 269



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

Region 186

05 Nov	N20E02	317	0040	03	Dso	003	B											
06 Nov	N19W12	318	0050	04	Dso	006	B											
07 Nov	N20W26	319	0030	04	Cro	005	B											
08 Nov	N20W37	317	0010	04	Bxo	004	B											
09 Nov	N20W50	317																
10 Nov	N20W63	317																

Still on Disk.

Absolute heliographic longitude: 317

Region 187

06 Nov	N07E07	299	0020	03	Cso	004	B	1			1							
07 Nov	N07W07	300	0020	04	Bxo	004	B											
08 Nov	N08W18	298	0010	03	Bxo	004	B											
09 Nov	N08W31	298																
10 Nov	N08W44	298																

Still on Disk.

Absolute heliographic longitude: 299

Region 188

06 Nov	N11E22	284	0030	03	Cso	006	B	3			6							
07 Nov	N11E07	286	0110	06	Dao	016	B				2							
08 Nov	N10W06	286	0110	06	Dsi	017	B											
09 Nov	N10W19	286	0090	05	Dao	008	B				1							
10 Nov	N10W34	287	0030	04	Dso	010	B											

Still on Disk.

Absolute heliographic longitude: 286

Region 189

06 Nov	N12E56	250	0010	01	Axx	001	A											
07 Nov	N14E43	250	0020	03	Bxo	002	B											
08 Nov	N13E32	248	0030	08	Cso	004	B											
09 Nov	N12E21	246	0030	07	Dso	004	B											
10 Nov	N12E09	244	0030	09	Cso	008	B											

Still on Disk.

Absolute heliographic longitude: 244



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

Region 190

07 Nov	S22E54	239	0030	04	Bxo	007	B											
08 Nov	S22E42	238	0040	06	Cao	004	B											
09 Nov	S22E28	239	0040	06	Dao	004	B											
10 Nov	S20E14	239	0030	06	Cso	006	B											
												0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 239

Region 191

08 Nov	S17E74	206	0060	02	Hsx	001	A											
09 Nov	S17E63	204	0310	13	Eai	011	B	1			4							
10 Nov	S18E51	202	0590	14	Ekc	035	B	1			4							
								2	0	0	8	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 202

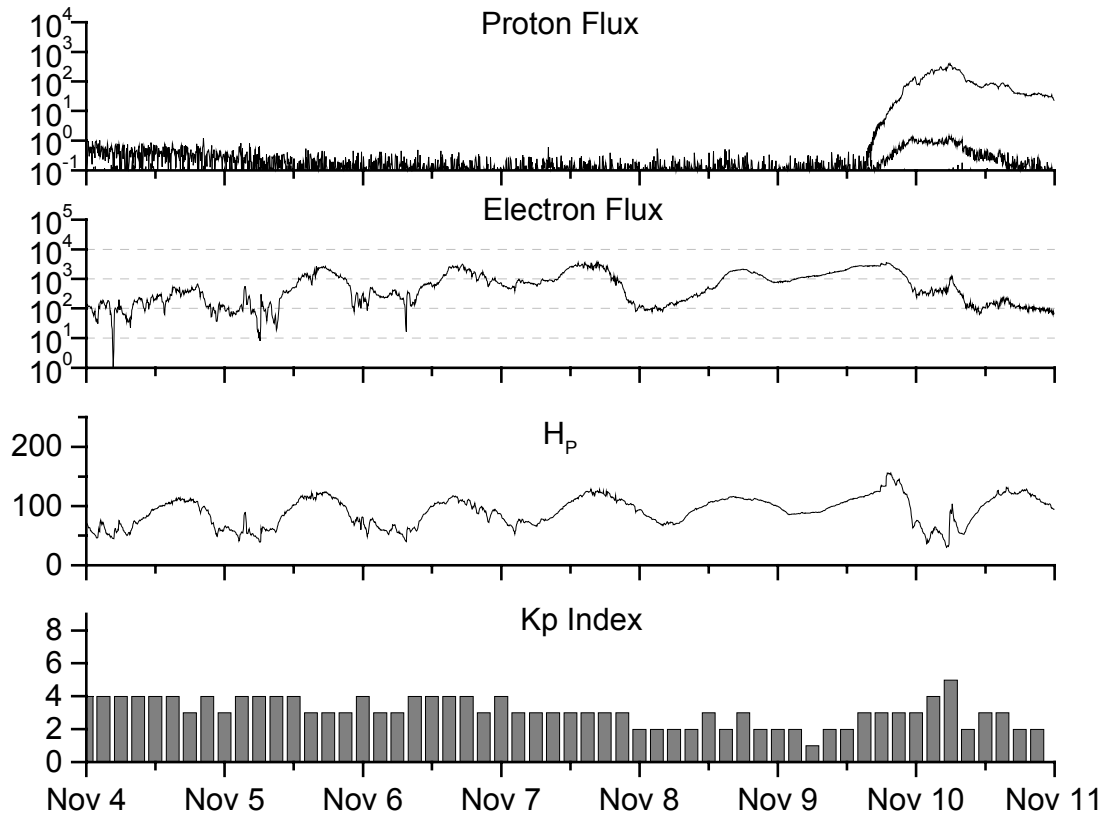


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2000									
November	149.9	106.5	0.71	162.7	112.7	178.8	173.9	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.1	08	14.4
2001									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.2	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.3	191.3	12	12.3
October	197.4	125.6	0.64	179.5	114.1	208.2	191.9	18	11.9
November	178.6	106.5	0.60	183.7	115.6	212.5	193.6	14	11.9
December	217.5	131.8	0.61	184.5	114.7	236.6	193.8	08	12.0
2002									
January	189.0	113.9	0.60	184.8	113.5	226.4	194.6	07	12.0
February	194.5	108.0	0.56	188.6	114.7	205.1	197.2	09	12.2
March	153.1	98.1	0.64	188.9	113.3	179.5	195.7	10	12.4
April	194.9	120.4	0.62	186.2	110.4	189.7	191.5	15	12.7
May	204.1	120.8	0.59			178.4		15	
June	146.0	88.5	0.61			148.8		11	
July	183.5	99.9	0.54			174.5		13	
August	191.0	116.4	0.61			184.0		16	
September	206.4	109.3	0.53			175.9		14	
October	153.9	97.5	0.63			165.1		23	

NOTE: All smoothed values after June 1999 and monthly values after December 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 04 November 2002

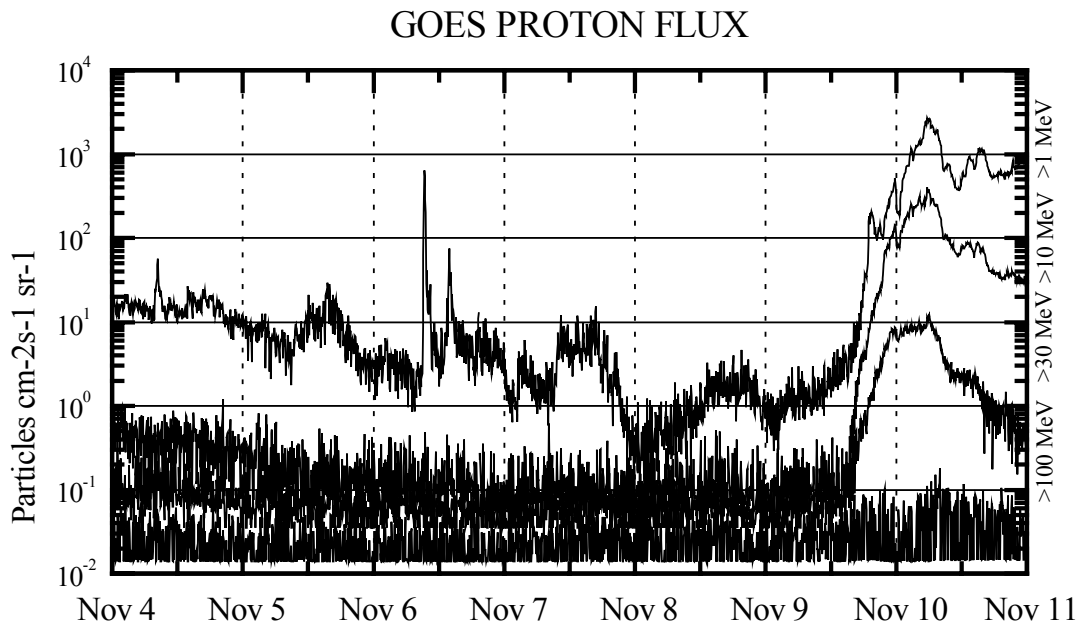
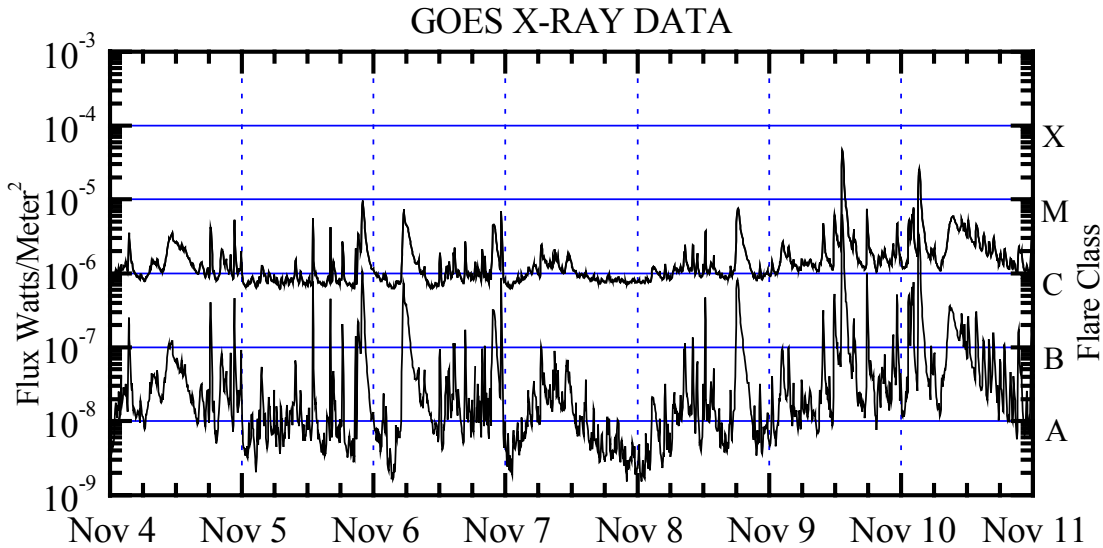
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p 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.

K_p plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) 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_p is subject to 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

X-ray plot contains five-minute averaged x-ray flux (watts/m²) 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/cm²-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/cm²-sec-sr) at greater than 10 MeV.





Space Environment Center

Active Regions

October 2002
(Month 73)



Preliminary data

Comparison of Cycles at current month in cycle

