

Space Weather Highlights
25 November - 01 December 2002

SWO PRF 1422
03 December 2002

Solar activity during the summary period has been low. The largest event was a C8/Sf flare on 28 November from Region 198 (S18, L=105, class/area Fki/640 on 18 November). Region 198 was in a gradual decay phase during the summary period and rotated beyond the west limb on 29 November. On 27-29 November, new Region 207 (S19, L=320, class/area Eao/430 on 29 November) produced a number of minor C-class flares and sub-flares. This region grew rapidly when it first rotated onto the visible disk but has become relatively stable by the end of the summary period. On 28 November, Region 208 (N10, L=288, class/area Dao/210 on 30 November) rotated onto the disk and has shown signs of polarity mixing in the leader spot.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Late on 26 November, an interplanetary shock was observed by the ACE spacecraft producing a -27 nT deflection in the Bz component of the interplanetary magnetic field. A corresponding increase in solar wind velocity to near 600 km/s was also recorded. The source of this shock was most likely the 33-degree disappearing solar filament with an associated partial halo CME on 24 November.

The greater than 10 MeV protons at geo-synchronous orbit were at background levels for most of the summary period. A slight enhancement in proton flux to near 1 pfu was observed on 25-27 November.

The greater than 2 MeV electron flux at geo-synchronous orbit reached high levels on 25 - 26 November and again on 29 November - 01 December.

The geomagnetic field was at quiet to active levels with one period of isolated minor storm condition and an isolated major storm condition at the higher latitudes. The interplanetary shock on 26 November resulted in an 18 nT sudden impulse at 26/2150 UTC, as measured by the Boulder magnetometer. The result of the sudden impulse was active to major storm conditions at high latitudes and active to minor storm conditions on the planetary indices. Unsettled to active conditions occurred on 29 November - 01 December due to effects from a recurring coronal hole.

Space Weather Outlook
04 December - 30 December 2002

Solar activity is expected to be low to moderate. Region 208 has the potential for minor M-class activity early in the forecast period. Old Region 192 (N12, L=234) and old Region 191 (S18, L=203) are due to return to the visible disk at the beginning of the period and may produce moderate activity during the first half of the forecast 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 04-07 December, 10-12 December, 20-21 December and 29-30 December due to recurring coronal holes.

The geomagnetic field is expected to be at quiet to active levels during the forecast period. Weak recurring coronal holes are expected on 07-09 December and 26-28 December with resulting unsettled to isolated active conditions. A stronger coronal hole is due to return to a geo-effective position on 18-19 December and is expected to result in active to isolated minor storm conditions.



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
25 November	137	106	880	B4.3	5	0	0	1	0	0	0	0
26 November	142	100	790	B5.1	3	0	0	2	0	0	0	0
27 November	143	112	760	B8.3	8	0	0	14	0	0	0	0
28 November	140	124	840	B7.6	14	0	0	5	1	0	0	0
29 November	141	107	620	B4.9	1	0	0	2	0	0	0	0
30 November	146	150	740	B4.4	1	0	0	1	0	0	0	0
01 December	150	97	620	B5.0	5	0	0	3	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
	25 November	2.7E+6	2.7E+4	2.9E+3		7.1E+7
26 November	1.7E+7	6.2E+4	3.1E+3		1.3E+8	
27 November	3.7E+7	5.5E+4	3.0E+3		5.6E+6	
28 November	5.2E+6	1.7E+4	2.8E+3		1.5E+7	
29 November	1.2E+6	1.5E+4	3.2E+3		2.9E+7	
30 November	5.2E+5	1.3E+4	3.1E+3		2.7E+7	
01 December	8.8E+5	1.2E+4	2.7E+3		4.2E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	25 November	*	*-3-2-2-2-3-2-2	*	*-3-4-6-5-5-3-2	17
26 November	6	1-1-1-1-1-1-1-4	15	2-2-1-4-4-3-2-4	14	3-3-2-2-3-3-2-5
27 November	13	3-4-3-3-3-1-2-2	32	4-4-6-5-4-3-3-3	21	4-4-4-4-4-3-3-3
28 November	10	3-3-3-1-2-2-3-1	26	3-3-4-5-5-4-3-3	15	3-4-3-3-3-3-3-2
29 November	9	2-1-3-1-2-3-3-2	22	2-2-4-3-5-4-4-3	14	3-3-4-2-3-4-3-3
30 November	*	*_*_*_*_*_*_*_*_*_*	*	*_*_*_*_*_*_*_*_*_*	16	3-4-4-3-3-3-3-3
01 December	*	*_*_*_*_*_*_*_*_*_*	*	*_*_*_*_*_*_*_*_*_*	16	4-3-3-4-4-3-3-3

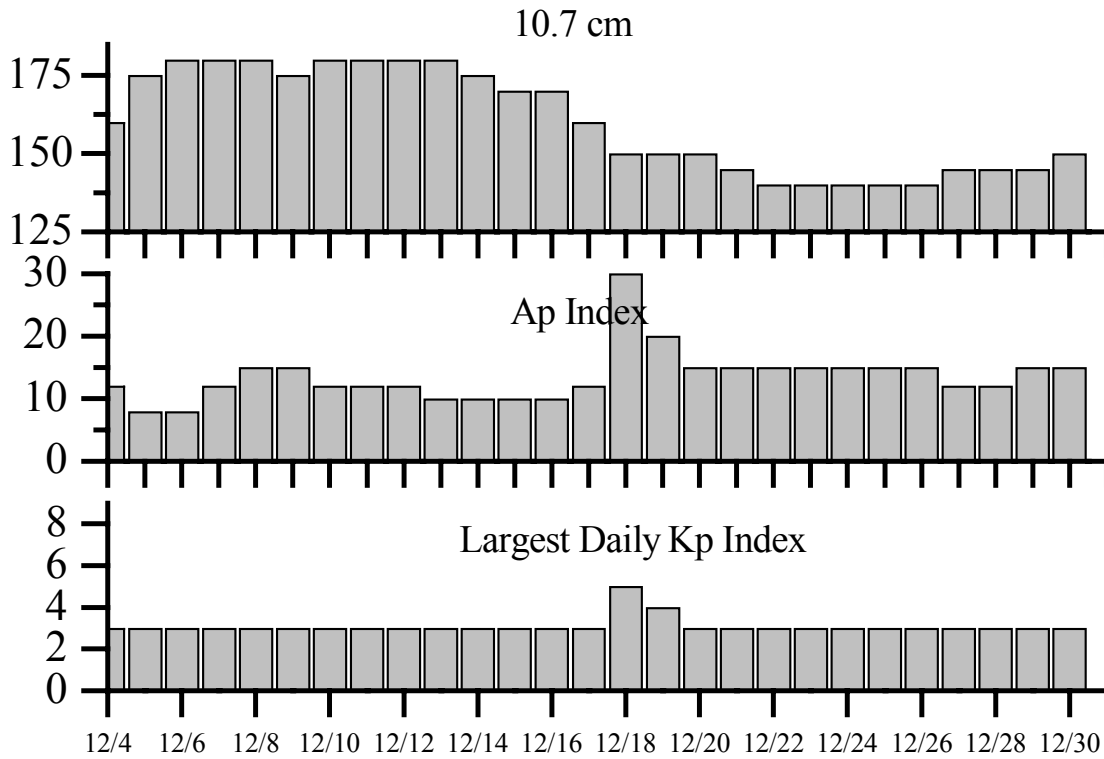


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
25 Nov 0008	8 - 245 MHz Radio Bursts	24 Nov
25 Nov 0008	1 - 245 MHz Radio Noise Storm	24 Nov
25 Nov 1012	ALERT: Geomagnetic K= 4	25 Nov 1012
25 Nov 1117	ALERT: Electron 2MeV Integral Flux > 1000pfu	25 Nov 1055
26 Nov 0024	3 - 245 MHz Radio Bursts	25 Nov
26 Nov 0024	1 - 245 MHz Radio Noise Storm	25 Nov
26 Nov 1043	ALERT: Electron 2MeV Integral Flux > 1000pfu	26 Nov 1020
26 Nov 2116	WARNING: Geomagnetic Sudden Impulse	26 Nov 2140 - Nov 26 2220
26 Nov 2134	WARNING: Geomagnetic K= 5	26 Nov 2135 - Nov 27 1500
26 Nov 2212	SUMMARY: Geomagnetic Sudden Impulse	26 Nov 2150
26 Nov 2324	ALERT: Geomagnetic K= 5	26 Nov 2321
27 Nov 0030	1 - 245 MHz Radio Burst	26 Nov
27 Nov 0030	1 - 245 MHz Radio Noise Storm	26 Nov
27 Nov 1456	WARNING: Geomagnetic K= 4 expected	27 Nov 1500 -2359
27 Nov 2354	EXTENDED WARNING: Geomagnetic K= 4	27 Nov 1500 - 28 Nov 1500
28 Nov 0048	5 - 245 MHz Radio Bursts	27 Nov
28 Nov 1554	ALERT: Geomagnetic K= 4	28 Nov 1553
28 Nov 2003	WARNING: Geomagnetic K- 4 expected	28 Nov 2005 -29 Nov 1200
29 Nov 1537	ALERT: Electron 2MeV Integral Flux > 1000pfu	29 Nov 1510
29 Nov 1835	WARNING: Geomagnetic K= 4 expected	29 Nov 1840 -30 Nov 0600
30 Nov 0018	2 - 245 MHz Radio Bursts	29 Nov
30 Nov 0018	1 - 245 MHz Radio Noise Storm	29 Nov
30 Nov 453	ALERT: Geomagnetic K= 4	30 Nov 0452
30 Nov 534	EXTENDED WARNING: Geomagnetic K= 4 expected	29 Nov 1840 -30 Nov 1500
30 Nov 1354	ALERT: Electron 2MeV Integral Flux > 1000pfu	30 Nov 1330
01 Dec 1247	ALERT: Electron 2MeV Integral Flux > 1000pfu	01 Dec 1230
01 Dec 1601	ALERT: Geomagnetic K= 4	01 Dec 1555



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
04 Dec	160	12	3	18 Dec	150	30	5
05	175	8	3	19	150	20	4
06	180	8	3	20	150	15	3
07	180	12	3	21	145	15	3
08	180	15	3	22	140	15	3
09	175	15	3	23	140	15	3
10	180	12	3	24	140	15	3
11	180	12	3	25	140	15	3
12	180	12	3	26	140	15	3
13	180	10	3	27	145	12	3
14	175	10	3	28	145	12	3
15	170	10	3	29	145	15	3
16	170	10	3	30	150	15	3
17	160	12	3				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	Begin	Max	Integ	Imp/ Brtns	Location		Radio Flux		Intensity	
			Class		Flux	Lat	CMD	245	2695	II

NO EVENTS OBSERVED

Flare List

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
25 November	1038	1042	1045	C1.3			
	1536	1537	1541		Sf	N25W68	197
	1623	1710	1800	C1.3			
	2025	2033	2044	C1.2			
	2230	2233	2235	C1.0			
	2342	2357	0012	C1.7			
26 November	0901	0906	0911	B7.7			
	1210	1211	1216	C1.0	Sf	N25W81	197
	1826	1835	1839	C3.6			197
	2305	2306	2313	C2.6	Sf	S16W65	198
27 November	0113	0119	0140	C2.4			
	0243	0246	0307	C6.7	Sf	S18W66	198
	0902	0905	0907	C1.4			
	0933	0943	0951	C2.3			198
	1138	1144	1152		Sf	S19E90	207
	1153	1205	1211		Sf	S19E69	207
	1224	1226	1231		Sf	S19E90	207
	1556	1606	1615		Sf	S17E72	207
	1620	1638	1702		Sf	S19E89	207
	1621	1643	1652		Sf	N15E48	204
	1637	1643	1653	C3.8	Sf	S20W72	198
	1653	1720	1733		Sf	N14E40	204
	1700	1707	1734		Sf	S18W63	198
	1720	1730	1742		Sf	S19E86	207
	2127	2127	2130	C3.5	Sf	S18E71	207
	2220	2224	2231	C2.9	Sf	S19W71	198
2258	2302	2316	C1.9	Sf	S18W72	198	
28 November	0036	0042	0048	C2.4			
	0106	0106	0113	C3.7	1f	S17W71	198
	0258	0258	0301	C2.4	Sf	S17W72	198
	0434	0437	0439	C1.0			
	0520	0543	0604	C2.5			
	0806	0821	0831	C4.3			
	1005	1022	1033	C3.4			
	B1134	U1134	A1217	C8.4	Sf	S20W74	198
	1246	1256	1303	C1.7			
1358	1408	1428	C3.5	Sf	S18E64	207	



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
28 November	1525	1526	1529	C2.0	Sf	S20E67	207
	1656	1701	1706	C1.8			
	1943	1946	1949	C1.4			
	B2049	U2049	A2054		Sf	S19E60	207
	2151	2224	2244	C3.1			
29 November	0429	0443	0455	C2.9			
	1506	1507	1519	B7.0	Sf	N19E52	207
	1600	1608	1620	B9.9			
	1817	1819	1834		Sf	S20E78	0
30 November	1123	1124	1133	B8.0	Sf	S19E67	209
	2208	2212	2216	C1.1			209
01 December	0355	0356	0406	C1.7	Sf	S21E61	209
	0528	0541	0554	C1.3			
	0955	0959	1005	B7.1			
	B1229	1238	1254	C1.0	Sf	N10E50	208
	1310	1347	1405	C1.1			
	B1525	1533	1539	C5.5	Sf	N10E49	208



Region Summary

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	4			
<i>Region 195</i>																		
13 Nov	S15E78	136	0120	02	Hax	001	A											
14 Nov	S16E65	136	0130	02	Hsx	001	A	1				4	1					
15 Nov	S15E53	134	0190	10	Dao	010	Bgd	1				3						
16 Nov	S16E41	133	0310	12	Eao	010	Bg	1				9						
17 Nov	S17E28	133	0340	12	Eho	008	B											
18 Nov	S17E15	133	0290	11	Eso	011	B											
19 Nov	S17E02	133	0260	11	Eao	014	B											
20 Nov	S17W11	134	0190	11	Eao	007	B											
21 Nov	S17W24	134	0140	11	Eao	006	B											
22 Nov	S17W37	134	0120	11	Eao	009	B											
23 Nov	S17W51	134	0180	13	Eso	007	B											
24 Nov	S16W66	136	0140	09	Dao	006	B											
25 Nov	S16W81	138	0110	10	Dso	005	B											
26 Nov	S16W92	135	0070	10	Cao	004	B											
								3	0	0	16	1	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 133

<i>Region 197</i>																		
14 Nov	N25E73	128	0250	03	Hhx	001	A											
15 Nov	N25E58	129	0270	03	Hhx	001	A											
16 Nov	N25E46	128	0290	03	Hhx	001	A											
17 Nov	N24E33	128	0280	04	Hhx	001	A											
18 Nov	N24E20	128	0320	03	Hhx	001	A											
19 Nov	N24E07	128	0320	04	Hkx	002	A											
20 Nov	N24W06	129	0310	03	Hhx	002	A											
21 Nov	N24W20	129	0320	04	Hkx	003	A											
22 Nov	N24W33	129	0360	03	Hhx	001	A											
23 Nov	N24W46	129	0300	04	Cso	003	B											
24 Nov	N26W58	128	0250	04	Hhx	003	A					1						
25 Nov	N25W71	128	0280	03	Hhx	001	A					1						
26 Nov	N24W84	127	0250	03	Hhx	001	A	2				1						
								2	0	0	3	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 129



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 198</i>																							
15 Nov	S16E78	109	0090	03	Dso	003	B																
16 Nov	S17E66	108	0380	09	Dho	008	B							2									
17 Nov	S18E55	106	0590	17	Fko	011	B	1	1				3										
18 Nov	S18E43	105	0640	17	Fki	021	Bg		1				1										
19 Nov	S18E28	107	0580	20	Fki	033	Bg	1					4										
20 Nov	S18E15	108	0570	22	Fkc	028	Bg	4	1				5										
21 Nov	S18E02	108	0570	22	Fki	039	Bg	8					10										
22 Nov	S18W12	108	0500	16	Fki	035	Bg	2					3		1								
23 Nov	S18W25	108	0520	15	Eki	033	Bg	2					4										
24 Nov	S18W36	106	0500	20	Fkc	036	Bg	2					2										
25 Nov	S18W48	105	0410	19	Fko	021	B	1															
26 Nov	S18W61	104	0390	18	Fko	015	B	1					1										
27 Nov	S18W75	105	0370	17	Fko	006	Bg	5					5										
28 Nov	S17W87	104	0270	14	Eko	010	B	3					2	1									
								30	3	0	41	2	1	0	0								

Crossed West Limb.

Absolute heliographic longitude: 108

Region 199

20 Nov	N27E13	110	0030	03	Axx	003	A															
21 Nov	N27W00	110	0020	05	Cso	008	B															
22 Nov	N27W14	110	0030	05	Bxo	007	B															
23 Nov	N27W27	110	0040	09	Bxo	016	B															
24 Nov	N27W42	112	0010	02	Bxo	002	B															
25 Nov	N28W54	111	0010	04	Bxo	003	B															
26 Nov	N27W58	101	0010	02	Bxo	002	B															
27 Nov	N27W71	101																				
28 Nov	N27W84	101																				
								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 110



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

Region 200

20 Nov N00E71	052	0060	02	Hsx	001	A											
21 Nov N00E57	052	0070	02	Hax	001	A											
22 Nov N00E44	052	0060	02	Hsx	001	A											
23 Nov N00E31	052	0050	01	Hsx	001	A											
24 Nov S01E17	053	0020	01	Hsx	001	A											
25 Nov S01E04	053	0020	01	Hsx	001	A											
26 Nov S02W09	052	0020	01	Hsx	001	A											
27 Nov S03W22	052	0020	02	Cso	003	B											
28 Nov S03W36	053	0020	03	Cso	003	B											
29 Nov S02W50	054	0000	00	Axx	002	A											
30 Nov S03W67	058	0000	00	Axx	001	A											
01 Dec S03W80	058																

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 053

Region 201

21 Nov S16W09	118	0010	04	Cso	004	B											
22 Nov S16W22	118	0040	06	Bxo	011	B											
23 Nov S16W35	118	0030	06	Cro	006	B											
24 Nov S15W54	124	0020	05	Bxo	003	B											
25 Nov S16W65	122	0010	02	Axx	002	A											
26 Nov S16W78	122																
27 Nov S16W91	122																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 118

Region 202

24 Nov N14E66	004	0050	07	Cso	002	B											2
25 Nov N13E53	004	0040	06	Cso	003	B											
26 Nov N13E41	002	0030	05	Cso	005	B											
27 Nov N13E27	003	0030	05	Cso	007	B											
28 Nov N14E14	003	0040	05	Dso	012	B											
29 Nov N13W01	005	0020	06	Cro	009	B											
30 Nov N15W16	007	0010	04	Bxo	007	B											
01 Dec N15W29	007																

0 0 0 2 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 005



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 203

26 Nov	N08E71	332	0020	01	Axx	002	A											
27 Nov	N09E56	334	0020	02	Cso	002	B											
28 Nov	N09E43	334	0010	01	Axx	001	A											
29 Nov	N10E29	335	0010	00	Hrx	001	A											
30 Nov	N09E17	334	0000	00	Axx	001	A											
01 Dec	N09E04	334																

Still on Disk.

Absolute heliographic longitude: 334

Region 204

27 Nov	N16E40	350	0040	06	Dso	008	B											
28 Nov	N17E28	349	0030	06	Cso	007	B											
29 Nov	N18E14	350	0010	03	Bxo	004	B											
30 Nov	N20W02	353	0010	04	Bxo	007	B											
01 Dec	N20W15	353																

Still on Disk.

Absolute heliographic longitude: 353

Region 205

27 Nov	N19E63	327	0050	01	Hsx	001	A											
28 Nov	N19E49	328	0040	01	Hsx	001	A											
29 Nov	N19E36	328	0050	02	Hsx	001	A											
30 Nov	N19E23	328	0020	01	Hsx	001	A											
01 Dec	N19E10	328	0020	01	Hsx	001	A											

Still on Disk.

Absolute heliographic longitude: 328

Region 206

27 Nov	S26E44	346	0010	01	Hsx	001	A											
28 Nov	S27E30	347	0000	00	Axx	001	A											
29 Nov	S27E17	347																
30 Nov	S27E04	347																
01 Dec	S27W09	347																

Still on Disk.

Absolute heliographic longitude: 347



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	4		
<i>Region 207</i>																	
27 Nov	S19E69	321	0220	09	Dao	004	B	1			7						
28 Nov	S19E59	318	0430	11	Eko	009	B	2			3						
29 Nov	S19E44	320	0430	12	Eao	014	B				1						
30 Nov	S19E31	320	0290	11	Eai	019	B										
01 Dec	S19E20	318	0230	13	Eai	020	B										
								3	0	0	11	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 318																	
<i>Region 208</i>																	
29 Nov	N09E75	289	0100	10	Dso	006	B										
30 Nov	N10E63	288	0210	07	Dao	012	B										
01 Dec	N10E49	289	0140	09	Dso	016	B	2			2						
								2	0	0	2	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 289																	
<i>Region 209</i>																	
30 Nov	S20E62	289	0140	09	Dao	008	B	1			1						
01 Dec	S21E48	290	0170	12	Eao	007	B	1			1						
								2	0	0	2	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 290																	
<i>Region 210</i>																	
30 Nov	S09W77	068	0060	04	Dso	004	B										
01 Dec	S08W87	065	0060	04	Dso	003	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 068																	

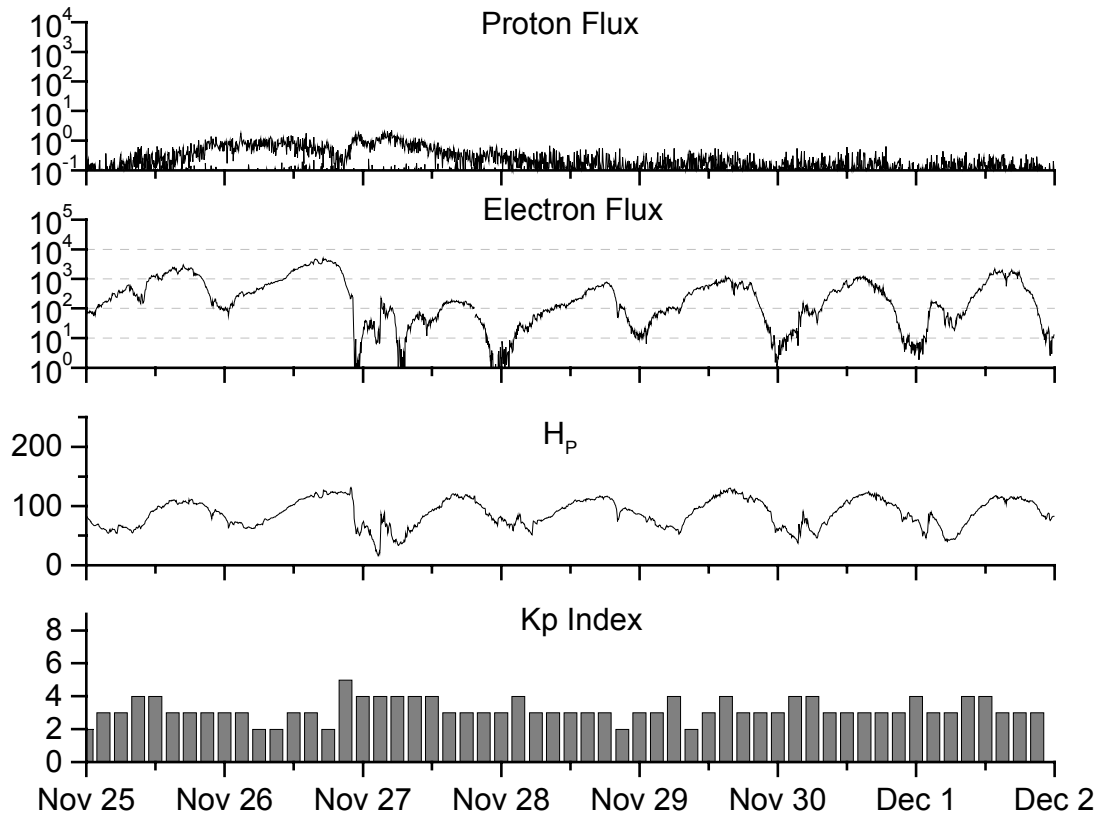


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 25 November 2002

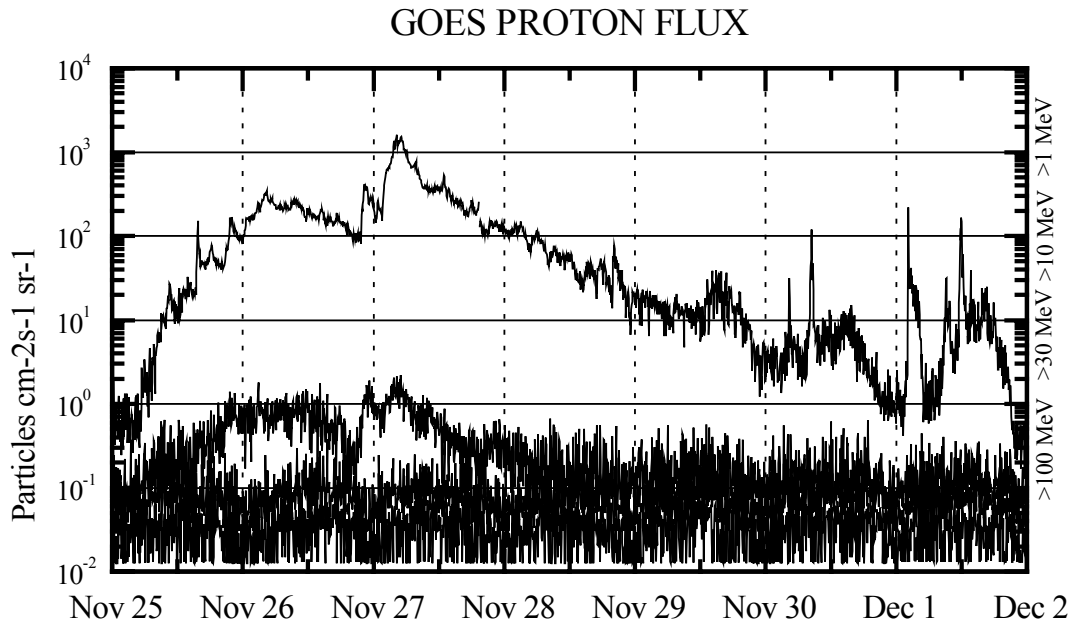
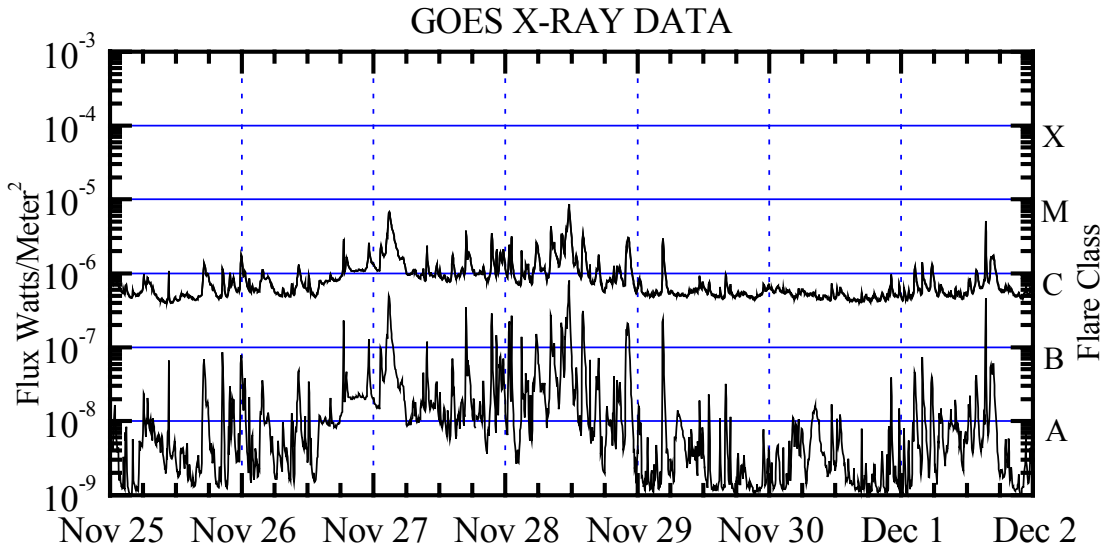
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

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.

