

Space Weather Highlights
06 November – 12 November 2006

SEC PRF 1628
14 November 2006

Solar activity was at very low to low levels. Solar activity reached low levels on 06, 07, and 12 November. Multiple C-class flares were observed on these days with the largest being a C8.8 from Region 921 (S06, L=139, class/area, Ehi/370 on 02 November) at 06/1746 UTC. This event had an associated Type II radio sweep and Tenflare with 110 sfu. LASCO C2 imagery showed a CME from the east limb at 06/1854 UTC. On 08 November, Region 923 (S04, L=003, class/area, Hkx/620 on 11 November) rotated onto the east limb. This region appeared as a large, magnetically simple region, yet has been responsible for multiple B and C-class flares.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 11 – 12 November.

The geomagnetic field ranged from quiet to major storm conditions at middle latitudes while quiet to severe storm periods were observed at high latitudes. The period began with a solar wind speed around 380 km/s while the IMF Bz did not vary much beyond +/- 3 nT. As a result, the geomagnetic field was quiet at all latitudes. By midday on 09 November, density, wind speed, and the IMF Bt increased as a recurrent coronal hole moved into geoeffective position. The IMF Bz began fluctuating between +13 and -15 nT. The geomagnetic field reached unsettled to active levels at middle latitudes while only unsettled levels were observed at high latitudes late on 09 November. By midday on 10 November, solar wind speed reached 630 km/s while the IMF Bz relaxed, not varying much beyond +/- 5 nT. Minor to major storm conditions were observed at middle latitudes with minor to severe storm periods at high latitudes. By midday on 11 November, solar wind speed reached a maximum around 650 km/s, with the IMF Bz not varying much beyond +/- 3 nT. Unsettled to active periods were observed at middle latitudes with active to major storm periods at high latitudes. By late on 11 November, wind speed was in decline and ended the period around 460 km/s. Mostly quiet to unsettled conditions were observed at all latitudes on 12 November.

Space Weather Outlook
15 November – 11 December 2006

Solar activity is expected to be at very low to low levels.

No greater than 10 MeV proton events are expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 15 – 23 November and 26 – 30 November, and again on 08 – 11 December.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. Recurrent coronal hole high speed wind streams are expected to rotate into geoeffective positions on 17 November, 24 – 25 November, and again on 07 – 08 December. Unsettled to active levels are expected on 17 November, while unsettled to minor storm periods are expected on 24 – 25 November. On 07 – 08 December, unsettled to major storm periods are expected.



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	
06 November	84	30	160	A7.0	2	0	0	0	0	0	0	0	0
07 November	87	26	90	B1.1	3	0	0	0	0	0	0	0	0
08 November	86	38	390	B1.1	0	0	0	0	0	0	0	0	0
09 November	89	29	520	A9.8	0	0	0	0	0	0	0	0	0
10 November	91	13	530	A8.8	0	0	0	0	0	0	0	0	0
11 November	97	13	620	A9.6	0	0	0	0	0	0	0	0	0
12 November	97	18	610	B1.0	4	0	0	0	0	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ² -day-sr)			Electron Fluence (electrons/cm ² -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
	06 November	5.8E+5	1.8E+4	3.8E+3		8.5E+6
07 November	5.5E+5	1.9E+4	4.1E+3		1.1E+7	
08 November	6.5E+5	1.8E+4	4.1E+3		1.3E+7	
09 November	1.4E+6	1.8E+4	3.9E+3		1.6E+7	
10 November	4.9E+6	1.9E+4	3.4E+3		2.7E+6	
11 November	5.7E+6	1.7E+4	3.3E+3		2.2E+8	
12 November	1.8E+6	1.6E+4	3.4E+3		6.3E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 November	1	0-0-2-0-0-0-1-0	2	0-0-2-2-0-0-0-0	1
07 November	0	0-0-0-0-1-0-0-0	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0
08 November	0	0-0-0-0-0-0-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-1-0-0-0
09 November	7	0-0-0-0-1-2-3-4	5	0-0-0-0-0-2-3-3	10	0-0-0-0-1-3-4-4
10 November	29	3-5-4-6-4-3-3-2	45	3-5-4-7-6-4-3-2	36	4-6-4-6-5-3-3-2
11 November	20	3-4-4-4-4-3-3-2	41	3-4-6-6-6-4-3-2	20	3-4-4-4-4-3-3-2
12 November	9	2-3-3-3-2-2-1-1	9	2-2-3-4-3-1-0-0	7	2-3-2-2-2-2-1-1

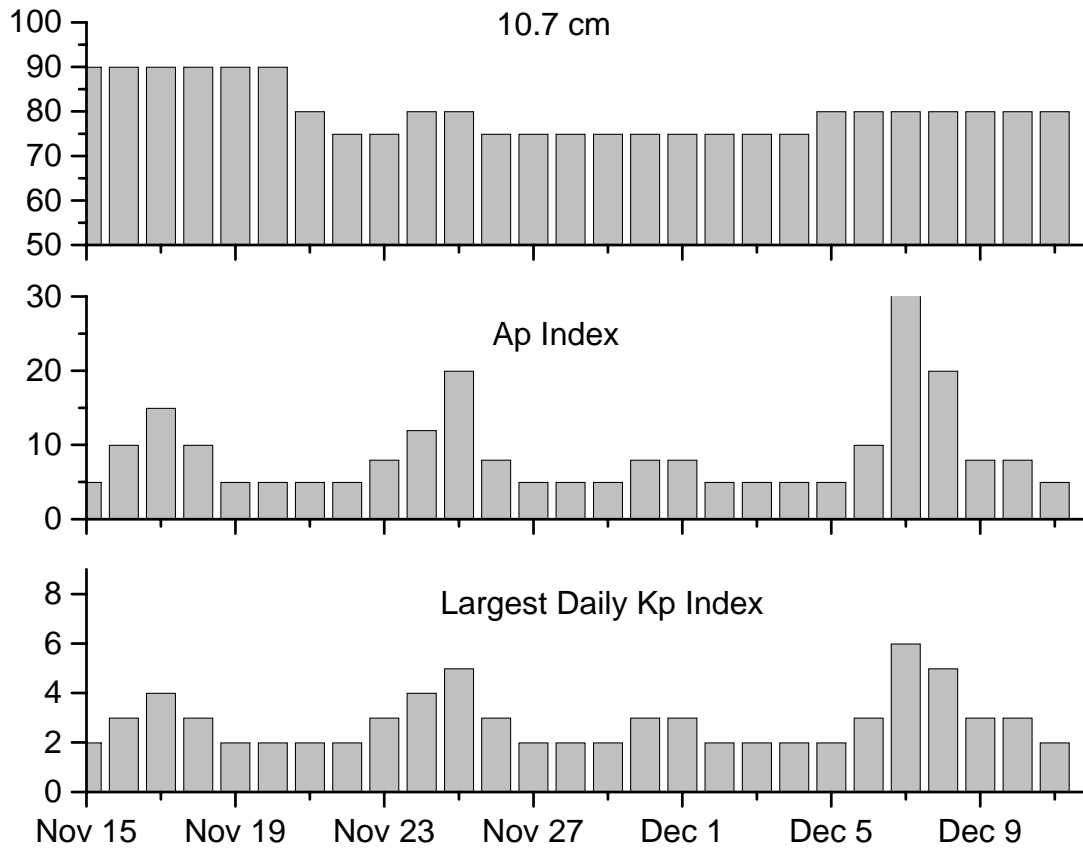


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
06 Nov 1749	SUMMARY: 10cm Radio Burst	06 Nov 1741
06 Nov 1801	ALERT: Type II Radio Emission	06 Nov 1742
08 Nov 0606	ALERT: Type IV Radio Emission	08 Nov 0435
09 Nov 1701	WARNING: Geomagnetic K=4	09 Nov 1659 - 2359
09 Nov 2323	ALERT: Geomagnetic K=4	09 Nov 2322
09 Nov 2354	EXTENDED WARNING: Geomagnetic K=4	09 Nov 1659 – 10/1600
10 Nov 0008	WARNING: Geomagnetic K=5	10 Nov 0010 - 1600
10 Nov 0514	ALERT: Geomagnetic K=5	10 Nov 0514
10 Nov 1003	WARNING: Geomagnetic K= 6	10 Nov 1005 - 1600
10 Nov 1010	ALERT: Geomagnetic K=6	10 Nov 1010
10 Nov 1555	EXTENDED WARNING: Geomagnetic K=4	09 Nov 1659 – 10/2359
10 Nov 2355	EXTENDED WARNING: Geomagnetic K=4	09 Nov 1659 – 11/1600
11 Nov 0755	WARNING: Geomagnetic K=5	11 Nov 0800 - 1600
11 Nov 0804	ALERT: Geomagnetic K=5	11 Nov 0802
11 Nov 1044	ALERT: Electron 2MeV Integral Flux >1000pfu	11 Nov 1025
11 Nov 1555	WARNING: Geomagnetic K=4	11 Nov 1600 - 2359
11 Nov 2354	EXTENDED WARNING: Geomagnetic K=4	11 Nov 1600 – 12/1600
12 Nov 0501	ALERT: Electron 2MeV Integral Flux >1000pfu	12 Nov 0500



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
15 Nov	90	5	2	29 Nov	75	5	2
16	90	10	3	30	75	8	3
17	90	15	4	01 Dec	75	8	3
18	90	10	3	02	75	5	2
19	90	5	2	03	75	5	2
20	90	5	2	04	75	5	2
21	80	5	2	05	80	5	2
22	75	5	2	06	80	10	3
23	75	8	3	07	80	35	6
24	80	12	4	08	80	20	5
25	89	20	5	09	80	8	3
26	75	8	3	10	80	8	3
27	75	5	2	11	80	5	2
28	75	5	2				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Max	Class	Flux	Imp/	Location	Rgn	Radio Flux		Intensity
						Brtns	Lat CMD		#	245	2695
<i>No Events Observed</i>											

Flare List

Date	Begin	Time		Optical	Imp/ Brtns	Location	Rgn
		Max	End	X-ray Class.		Lat CMD	
06 November	0133	0137	0141	B8.5			922
	0525	0529	0531	B3.4			921
	0905	0910	0912	B2.2			921
	1018	1051	1122	C2.4			921
	1743	1746	1806	C8.8			
	2354	0000	0007	B5.8			
07 November	0024	0041	0051	C1.2			923
	0256	0301	0306	B2.9			923
	0402	0405	0407	B2.3			923
	1243	1255	1304	C3.0			923
	1325	1346	1406	C6.5			923
	1501	1505	1508	B5.8			
08 November	0129	0136	0141	B4.4			923
	0207	0212	0215	B6.4			923
	0431	0440	0445	B4.3			923
	0457	0508	0514	B4.5			923
	1150	1153	1158	B1.9			921
	1223	1233	1242	B6.6			923
	1451	1455	1459	B3.1			923
	1724	1730	1733	B4.3			921
	1955	1959	2001	B1.9			
	2009	2051	2055	B2.8			
2357	0002	0006	B2.3				



Flare List-Continued

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn	
	Begin	Max	End	X-ray Class.				
09 November	0206	0212	0215	B2.3				
	0425	0429	0432	B1.8				
	0825	0830	0833	B4.7			923	
	0940	0943	0945	B1.8				
	0952	0955	0957	B2.0				
	1016	1020	1024	B1.6			923	
	1058	1104	1108	B4.3				
	1135	1140	1145	B2.8			923	
	1926	1937	1939	B2.9				
	2033	2039	2043	B2.6				
10 November	0120	0123	0126	B1.3				
	0135	0138	0143	B1.7				
	0207	0211	0214	B1.6				
	0307	0310	0312	B1.4				
10 November	2307	2313	2318	B6.8				
11 November	0052	0056	0059	B1.9				
	0736	0741	0743	B7.8			923	
	0833	0836	0843	B1.9			923	
	1010	1016	1023	B3.0			923	
	1121	1125	1131	B2.1				
	1132	1136	1140	B3.2			923	
	1310	1315	1319	B2.6			923	
	1401	1404	1406	B2.4			923	
	1430	1437	1445	B1.9			923	
	1737	1744	1746	B1.7			923	
	1842	1846	1848	B3.5			923	
	2040	2043	2046	B1.9			923	
	2252	2256	2300	B8.5			923	
	12 November	0015	0018	0021	B1.8			
		0138	0151	0158	B2.4			923
0237		0240	0243	B2.6			923	
0732		0738	0742	C1.0			923	
0939		0946	0952	C1.0			923	
1038		1047	1054	C1.1			923	
2115		2118	2120	B1.2				
2145		2155	2203	C3.3			923	



Region Summary

Location		Sunspot Characteristics													
		Flares													
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	(° Lat ° CMD)	Lon	(10 ⁻⁶ hemi)	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4

Region 921

30 Oct	S06E58	137	0050	05	Cro	005	B									1
31 Oct	S07E44	138	0120	08	Dai	012	Bg									
01 Nov	S07E30	139	0270	13	Eai	022	Bg									
02 Nov	S06E16	139	0370	14	Ehi	031	Bg									
03 Nov	S06E02	140	0250	14	Esi	026	Bg									
04 Nov	S06W11	140	0320	14	Eai	022	Bg									
05 Nov	S08W24	140	0290	13	Eso	026	Bg	2				2				
06 Nov	S06W39	142	0140	12	Eao	009	Bg	1								
07 Nov	S07W52	142	0080	10	Dso	004	B									
08 Nov	S06W66	142	0100	09	Dso	006	B									
09 Nov	S06W79	142	0070	09	Dso	003	B									
								3	0	0	3	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 140

Region 922

31 Oct	S15E58	124	0030	05	Cro	002	B									
01 Nov	S14E44	125	0040	06	Cso	004	B									
02 Nov	S14E31	124	0090	07	Dso	008	B	1								
03 Nov	S13E18	124	0070	07	Dso	011	B									
04 Nov	S14E03	126	0080	08	Dso	010	B									
05 Nov	S09W13	129	0090	10	Cao	016	B									
06 Nov	S08W24	127	0020	00	Axx	001	A									
07 Nov	S13W37	127	0010	07	Hsx	002	A									
08 Nov	S12W50	126	0010	01	Axx	001	A									
09 Nov	S12W63	126														
10 Nov	S12W76	126														
11 Nov	S12W89	126														
								1	0	0	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 126



Region Summary-Continued

Location		Sunspot Characteristics												
		Flares												
Date	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 923

08 Nov	S05E71	005	0280	04	Hkx	001	A								
09 Nov	S06E59	004	0450	05	Hkx	006	A								
10 Nov	S05E46	004	0530	06	Hkx	003	A								
11 Nov	S04E34	003	0620	06	Hkx	003	A								
12 Nov	S04E22	003	0610	07	Dki	008	B	3							
								3	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 003

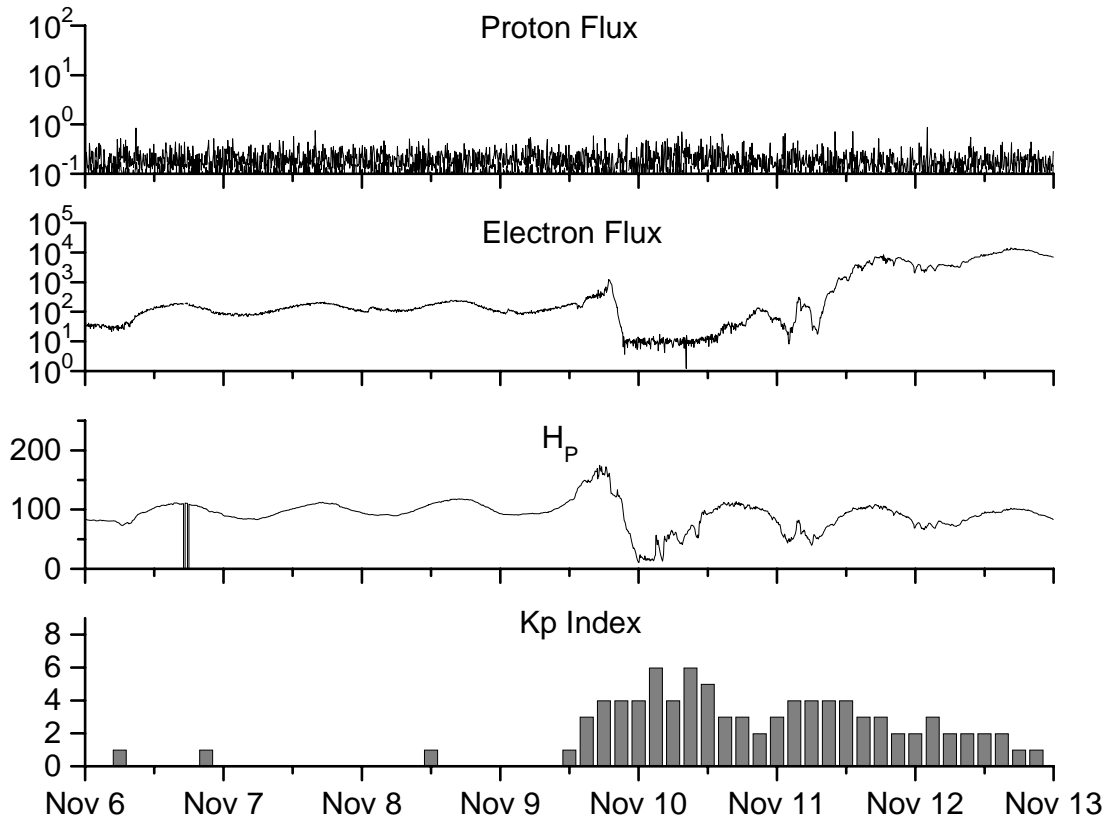


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SEC	Ratio RI	Ratio RI/SEC	Smooth values SEC	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2004									
November	70.5	43.7	0.62	60.0	35.4	113.2	101.5	26	14.1
December	34.7	17.9	0.52	58.8	35.3	94.6	101.3	11	14.8
2005									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56			81.0		8	
June	37.7	13.9	0.37			80.1		8	
July	22.6	12.2	0.54			75.8		7	
August	22.8	12.9	0.57			79.0		9	
September	25.2	14.5	0.58			77.8		8	
October	15.7	10.4	0.66			74.3		7	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 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 23, RI= 120.8, occurred April 2000. *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 06 November 2006*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

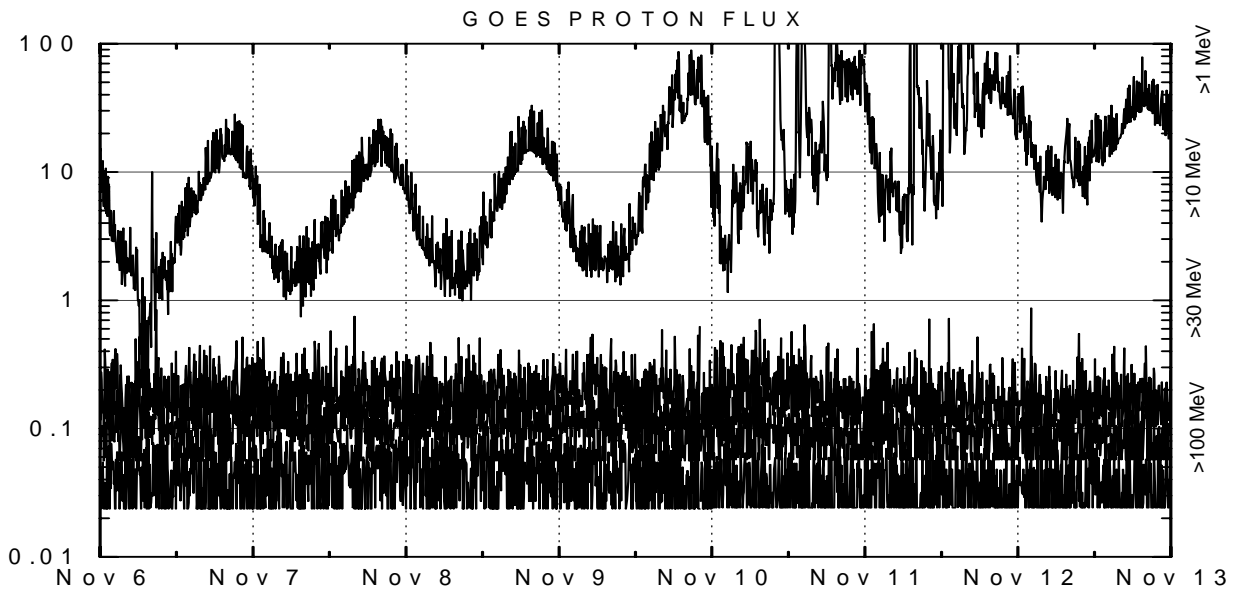
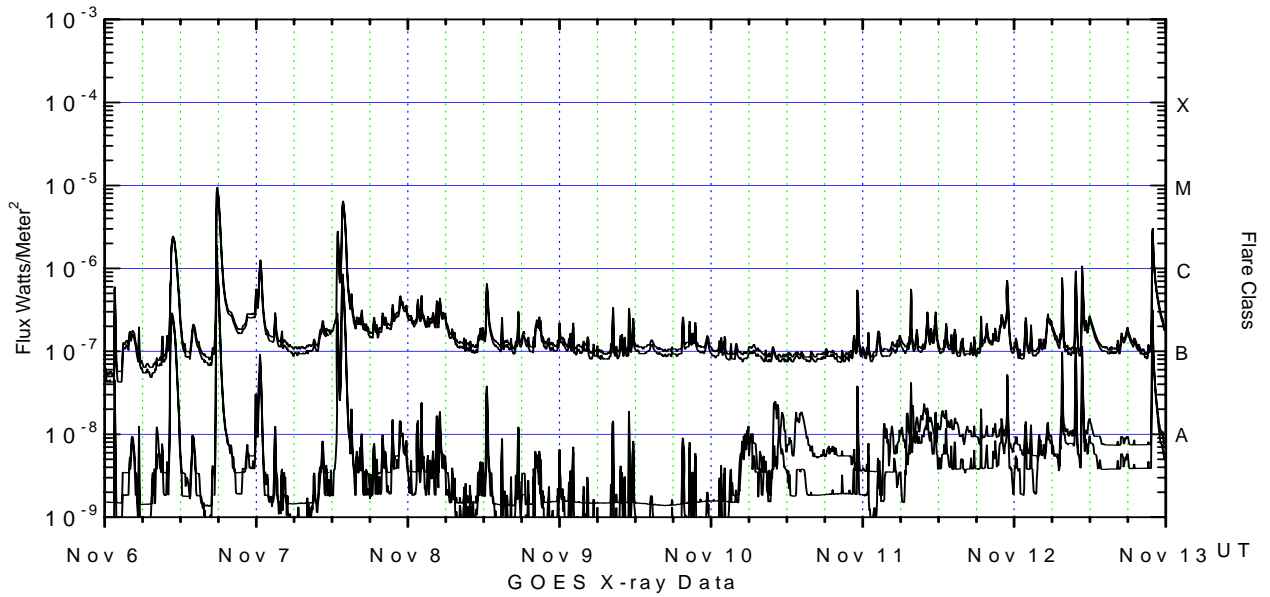
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. 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 Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) 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 SEC 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 parallel 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 12 (W075) and GOES 11 (W135) 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-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event

