

Space Weather Highlights
20 November – 26 November 2006

SEC PRF 1630
28 November 2006

Solar activity was very low during the period. Isolated low-level B-class flare activity occurred on most days.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 25 – 26 November.

Geomagnetic field activity was at quiet levels at all latitudes through 22/1800 UTC, then increased to quiet to unsettled levels. Activity increased to unsettled to minor storm levels during 23 - 24 November with brief localized major storm periods at high latitudes. Activity decreased to quiet to active levels on 25 - 26 December with brief periods of minor storm at high latitudes. This activity was associated with a recurrent coronal hole high-speed stream. ACE RTSW data indicated the high-speed stream (HSS) commenced early on 23 November and continued through the remainder of the period. Peak wind speed associated with the HSS was 677 km/sec around midday on 26 November. Maximum IMF variations associated with the HSS included increased total field intensity with a peak of 18 nT early on 23 November and periods of southward Bz to - 12 nT early on 23 November.

Space Weather Outlook
29 November – 25 December 2006

Solar activity is expected to be at very 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 during 29 – 30 November, 08 – 12 December, and 22 - 25 December.

The geomagnetic field is expected to be mostly quiet to unsettled for the majority of the forecast period. However, a recurrent coronal hole HSS is expected to affect the field during 07 - 08 December with active to major storm periods expected. Another recurrent HSS is expected to affect the field during 20 - 22 December with active to minor storm conditions 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	
20 November	81	33	340	A5.9	0	0	0	0	0	0	0	0	0
21 November	78	11	10	A6.1	0	0	0	0	0	0	0	0	0
22 November	77	0	0	A2.2	0	0	0	0	0	0	0	0	0
23 November	77	0	0	A1.7	0	0	0	0	0	0	0	0	0
24 November	77	0	0	A4.2	0	0	0	0	0	0	0	0	0
25 November	79	12	260	A3.9	0	0	0	0	0	0	0	0	0
26 November	78	12	160	A3.3	0	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
	20 November	3.7E+5	1.8E+4	4.3E+3		2.9E+7
21 November	7.8E+5	1.7E+4	4.1E+3		3.8E+7	
22 November	1.3E+6	1.7E+4	4.0E+3		4.2E+7	
23 November	7.2E+5	1.6E+4	3.8E+3		2.1E+6	
24 November	1.4E+6	1.6E+4	3.8E+3		2.4E+7	
25 November	3.6E+6	1.6E+4	3.6E+3		1.6E+8	
26 November	1.6E+6	1.6E+4	3.6E+3		2.0E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 November	1	0-0-0-0-1-1-1-0	1	0-1-0-0-0-0-0-1	2
21 November	1	1-0-0-0-1-0-0-0	0	0-0-0-0-0-0-0-0	1	0-0-0-0-0-0-0-1
22 November	3	0-0-0-1-2-1-1-2	4	2-1-0-0-0-0-2-3	4	0-0-0-0-1-1-3-3
23 November	8	0-1-3-3-2-1-2-3	34	4-1-5-6-5-4-3-4	18	1-1-4-5-4-3-3-3
24 November	10	3-3-3-2-2-2-2-2	32	2-5-5-5-6-2-2-2	21	3-5-5-3-3-2-2-2
25 November	10	1-3-1-1-2-3-3-3	21	3-2-1-4-5-5-3-2	15	2-4-2-2-3-4-4-3
26 November	9	2-3-3-2-3-1-2-2	17	3-2-3-4-5-2-2-2	15	3-4-4-3-2-1-3-3

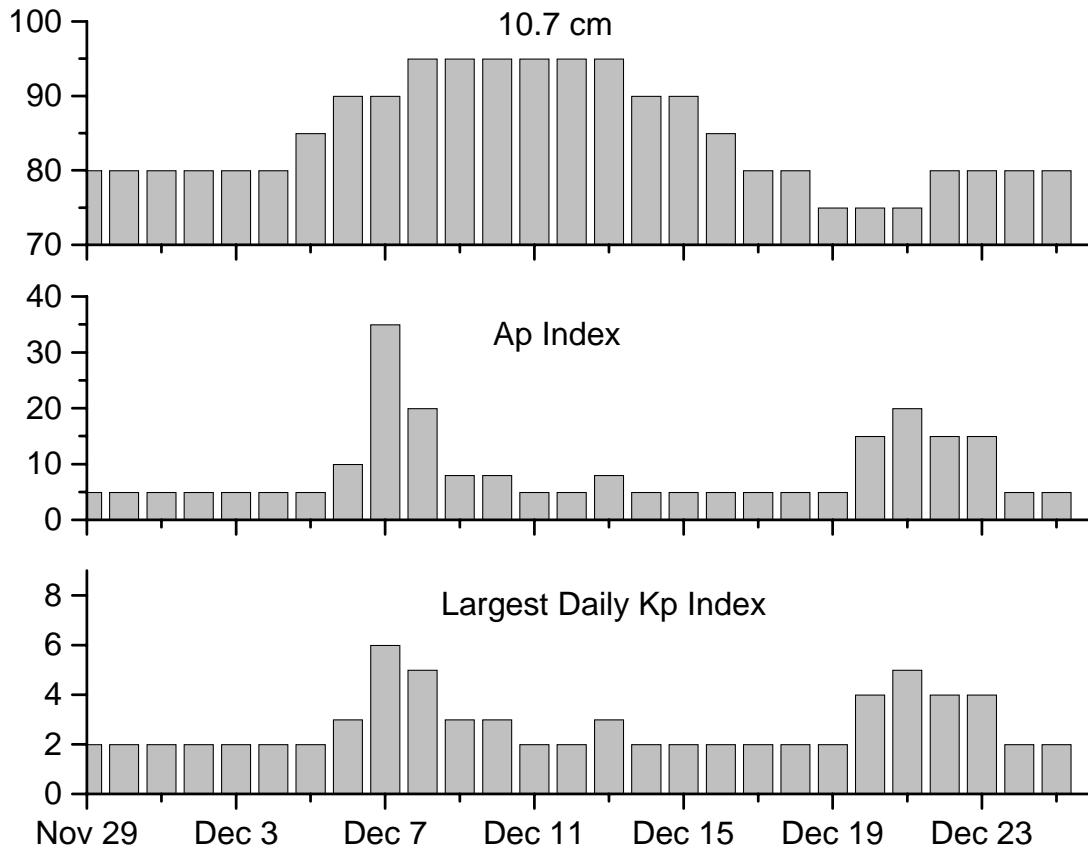


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
23 Nov 0739	WARNING: Geomagnetic K = 4	23 Nov 0740 – 2359
23 Nov 1039	ALERT: Geomagnetic K = 4	23 Nov 1039
23 Nov 1049	WARNING: Geomagnetic K = 5	23 Nov 1047 – 1600
23 Nov 1056	ALERT: Geomagnetic K = 5	23 Nov 1051
23 Nov 1558	EXTENDED WARNING: Geomagnetic K = 5	23 Nov 1047 – 2359
24 Nov 0332	WARNING: Geomagnetic K = 4	23 Nov 0332 – 1600
24 Nov 0335	ALERT: Geomagnetic K = 4	23 Nov 0334
24 Nov 0345	WARNING: Geomagnetic K = 5	24 Nov 0344 – 1600
24 Nov 0838	ALERT: Geomagnetic K = 5	24 Nov 0837
24 Nov 1557	EXTENDED WARNING: Geomagnetic K = 4	24 Nov 0332 – 2359
24 Nov 2354	EXTENDED WARNING: Geomagnetic K = 4	24 Nov 0332 – 25/1600
25 Nov 0841	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	25 Nov 0835
25 Nov 1555	EXTENDED WARNING: Geomagnetic K = 4	24 Nov 0332 – 25/2359
26 Nov 0337	WARNING: Geomagnetic K = 4	26 Nov 0336 – 1600
26 Nov 0338	ALERT: Geomagnetic K = 4	26 Nov 0337
26 Nov 0754	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	26 Nov 0735



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
29 Nov	80	5	2	13 Dec	95	8	3
30	80	5	2	14	90	5	2
01 Dec	80	5	2	15	90	5	2
02	80	5	2	16	85	5	2
03	80	5	2	17	80	5	2
04	80	5	2	18	80	5	2
05	85	5	2	19	75	5	2
06	90	10	3	20	75	15	4
07	90	35	6	21	75	20	5
08	95	20	5	22	80	15	4
09	95	8	3	23	80	15	4
10	95	8	3	24	80	5	2
11	95	5	2	25	80	5	2
12	95	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	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
20 November	0652	0658	0701	B3.5			
	0705	0708	0711	B1.9			
	0737	0743	0746	B3.4			
	0858	0903	0907	B1.7			
	1002	1009	1013	B1.8			
	1107	1135	1155	B4.1			
	1228	1247	1255	B1.8			
	1316	1325	1335	B5.7			
	1418	1450	1456	B2.4			
	1559	1613	1637	B2.6			
	1707	1718	1722	B1.5			
	1738	1741	1746	B2.1			
	1857	1906	1911	B3.7			
	1935	1938	1941	B2.1			
	2021	2025	2030	B1.0			
	2200	2205	2209	B1.5			
2221	2234	2244	B1.8				
2300	2303	2307	B1.0				
2311	2315	2318	B1.5				
21 November	0000	0003	0006	B1.1			
	0016	0021	0025	B3.7			
	0237	0253	0257	B1.7			
	0403	0424	0434	B1.1			
	0659	0707	0713	B1.6			
	0826	0832	0839	B2.3			
	0947	0954	1002	B4.3			
	1119	1124	1131	B1.9			
1346	1353	1403	B3.5				
1617	1629	1650	B3.3				
22 November	<i>No Flares Observed</i>						
23 November	<i>No Flares Observed</i>						
24 November	1222	1228	1234	B2.0			926
	1240	1245	1250	B1.6			926
	2004	2007	2009	B1.3			926
	2100	2103	2107	B1.2			926
25 November	0504	0507	0509	B1.3			926
	0551	0555	0558	B1.5			926



Flare List – continued.

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
25 November	0836	0840	0842	B4.5			926
	2023	2028	2032	B1.2			926
	2116	2123	2129	B1.4			926
26 November	0452	0455	0458	B1.5			926
	2137	2142	2146	B1.1			926

Region Summary

Location		Sunspot Characteristics						Flares						
Date	(° 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 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										
13 Nov S05E07	003	0640	06	Cko	007	B											
14 Nov S05W05	002	0660	08	Cko	007	B											
15 Nov S05W20	004	0610	06	Cko	011	B											
16 Nov S05W33	003	0580	06	Cko	005	B											
17 Nov S05W48	006	0510	05	Cho	002	B					2						
18 Nov S05W61	006	0510	05	Cko	004	B					2						
19 Nov S05W74	005	0510	05	Hkx	002	A					1						
20 Nov S06W88	006	0310	06	Hhx	001	A											
							3	0	0	5	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 002



Region Summary – continued.

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

Region 924

13 Nov S07E59	311	0070	11	Cao	003	B											
14 Nov S08E44	313	0040	06	Dso	003	B											
15 Nov S08E28	316	0030	04	Dso	005	B	1				1						
16 Nov S08E16	315	0050	05	Dao	005	B											
17 Nov S08E00	318	0040	05	Cao	004	B											
18 Nov S09W15	320	0030	05	Cao	002	A											
19 Nov S09W30	321	0020	01	Cso	002	B											
20 Nov S09W43	321	0020	01	Hrx	001	A											
21 Nov S09W56	321	0010	01	Axx	001	A											
22 Nov S09W69	321																
23 Nov S09W82	321																
24 Nov S09W95	321																

1 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 318

Region 925

14 Nov S06E52	305	0100	03	Hax	001	A											
15 Nov S05E38	306	0040	03	Cao	004	B											
16 Nov S05E26	305	0060	03	Hsx	002	A											
17 Nov S05E11	307	0020	02	Hrx	002	A											
18 Nov S07E00	305	0040	05	Cso	003	B											
19 Nov S09W13	305	0020	03	Cso	004	A											
20 Nov S07W27	305	0010	01	Axx	001	A											
21 Nov S07W40	305																
22 Nov S07W53	305																
23 Nov S07W66	305																
24 Nov S07W79	305																
25 Nov S07W92	305																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 305

Region 926

25 Nov S08E73	140	0260	04	Hkx	002	A											
26 Nov S08E60	140	0160	04	Hkx	002	A											

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 140

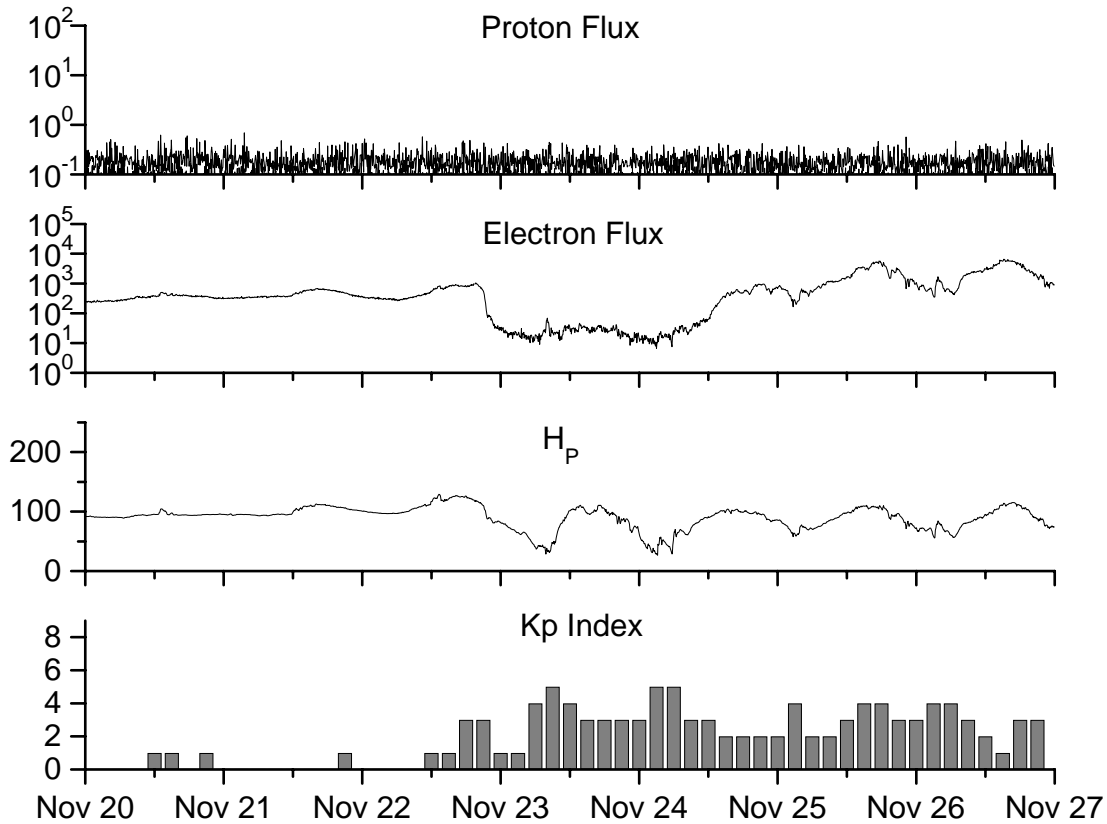


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 20 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.

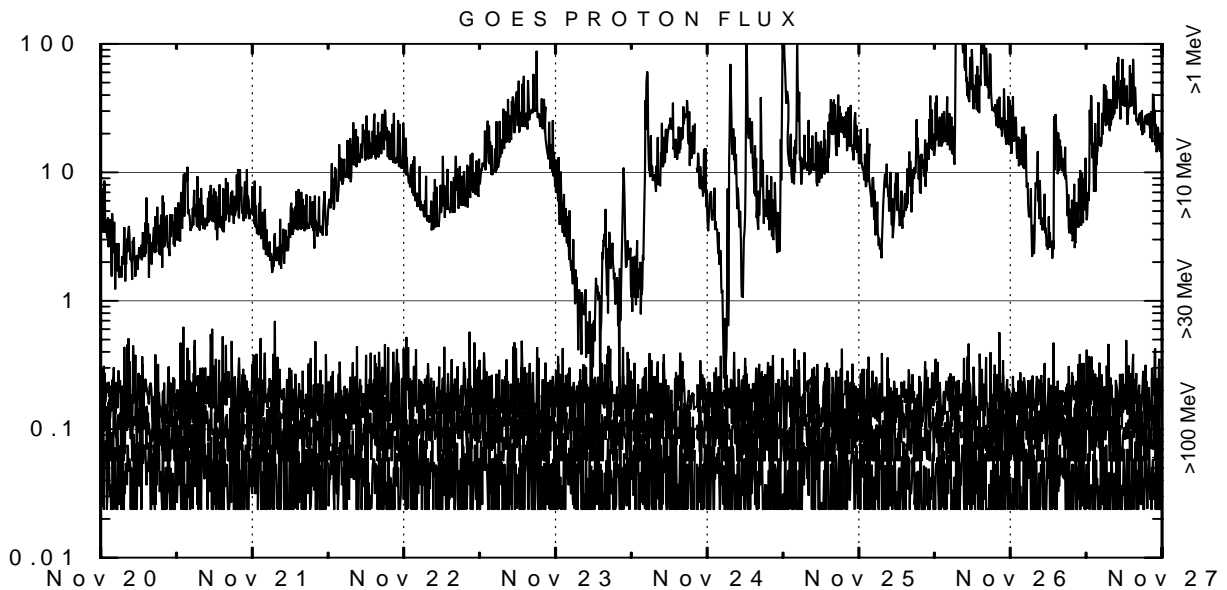
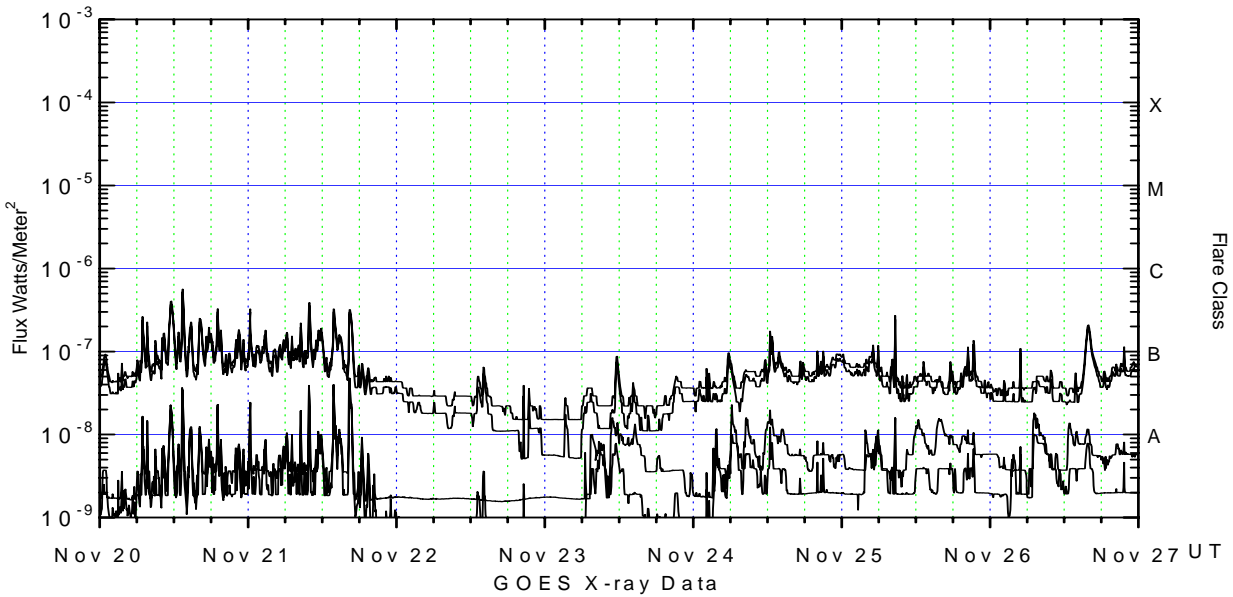
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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 threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

