

Space Weather Highlights
09 October – 15 October 2006

SEC PRF 1624
17 October 2006

Solar activity was at very low levels. Only a few low level B-class flares were observed during the period.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 14 – 15 October.

The geomagnetic field ranged from quiet to major storm levels. The period began with the solar wind speed around 440 km/s while the IMF Bz did not vary much beyond +/- 3 nT. The geomagnetic field was mostly quiet. Wind speed continued to decrease to a low of approximately 310 km/s early on 12 October. Early on 11 October, density increased and phi changed from negative to positive indicating a solar sector boundary crossing. Late on 12 October, wind speed began to rise slowly while the IMF Bz began fluctuating between +/- 10 nT due to a coronal hole high speed stream moving into geoeffective position. The geomagnetic field responded with unsettled to active periods at middle latitudes with minor to major storm periods at high latitudes on 13 October. Wind speed increased to around 580 km/s by early on 14 October while the IMF Bz relaxed to around +/- 5 nT. The geomagnetic field responded with quiet to unsettled conditions at middle latitudes with minor to major storm periods at high latitudes on 14 October. By 15 October, solar wind speed hit a maximum around 610 km/s, while the IMF Bz did not vary much beyond +/- 3 nT. Isolated active periods were observed at high latitudes on the 15th with quiet to unsettled conditions at middle latitudes. By the end of the period, solar wind speed decreased to around 515 km/s.

Space Weather Outlook
18 October – 13 November 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 on 18 – 20 October, 22 - 26 October, 28 October – 03 November, and 10 – 13 November.

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 20 – 21 October, 28 October, and 09 – 10 November. Unsettled to minor storm periods are possible on those dates.



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	
09 October	75	11	30	<A1.0	0	0	0	0	0	0	0	0	0
10 October	75	11	10	<A1.0	0	0	0	0	0	0	0	0	0
11 October	74	0	0	<A1.0	0	0	0	0	0	0	0	0	0
12 October	74	0	0	<A1.0	0	0	0	0	0	0	0	0	0
13 October	73	0	0	<A1.0	0	0	0	0	0	0	0	0	0
14 October	72	0	0	<A1.0	0	0	0	0	0	0	0	0	0
15 October	71	0	0	<A1.0	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
	09 October	4.9E+5	1.7E+4	3.7E+3		7.1E+6
10 October	9.2E+5	1.7E+4	3.7E+3		1.0E+7	
11 October	7.4E+5	1.7E+4	3.9E+3		1.1E+7	
12 October	8.0E+5	1.8E+4	4.2E+3		1.3E+7	
13 October	9.0E+5	1.7E+4	4.1E+3		1.1E+6	
14 October	6.7E+6	1.7E+4	3.8E+3		6.5E+7	
15 October	1.4E+6	1.7E+4	3.9E+3		5.0E+8	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	09 October	3	0-3-1-0-1-0-1-0	2	0-1-2-1-0-0-0-0	5
10 October	0	1-0-0-0-0-0-0-0	1	0-0-0-1-0-0-1-0	2	1-0-0-0-0-1-0-1
11 October	2	1-1-2-0-1-0-0-0	2	1-0-1-1-1-0-0-0	3	1-0-2-0-1-1-0-1
12 October	3	2-1-1-0-1-1-0-2	5	0-0-0-2-3-3-0-1	5	2-1-1-1-1-2-0-3
13 October	15	1-2-3-3-3-2-4-4	32	1-2-6-4-5-5-3-4	24	2-3-4-4-3-3-5-4
14 October	12	3-3-2-2-2-3-3-3	32	2-3-5-6-4-5-3-3	18	4-4-3-3-2-3-3-4
15 October	9	3-3-3-2-1-1-2-2	14	3-2-4-4-3-2-2-1	10	3-3-2-3-1-1-1-2

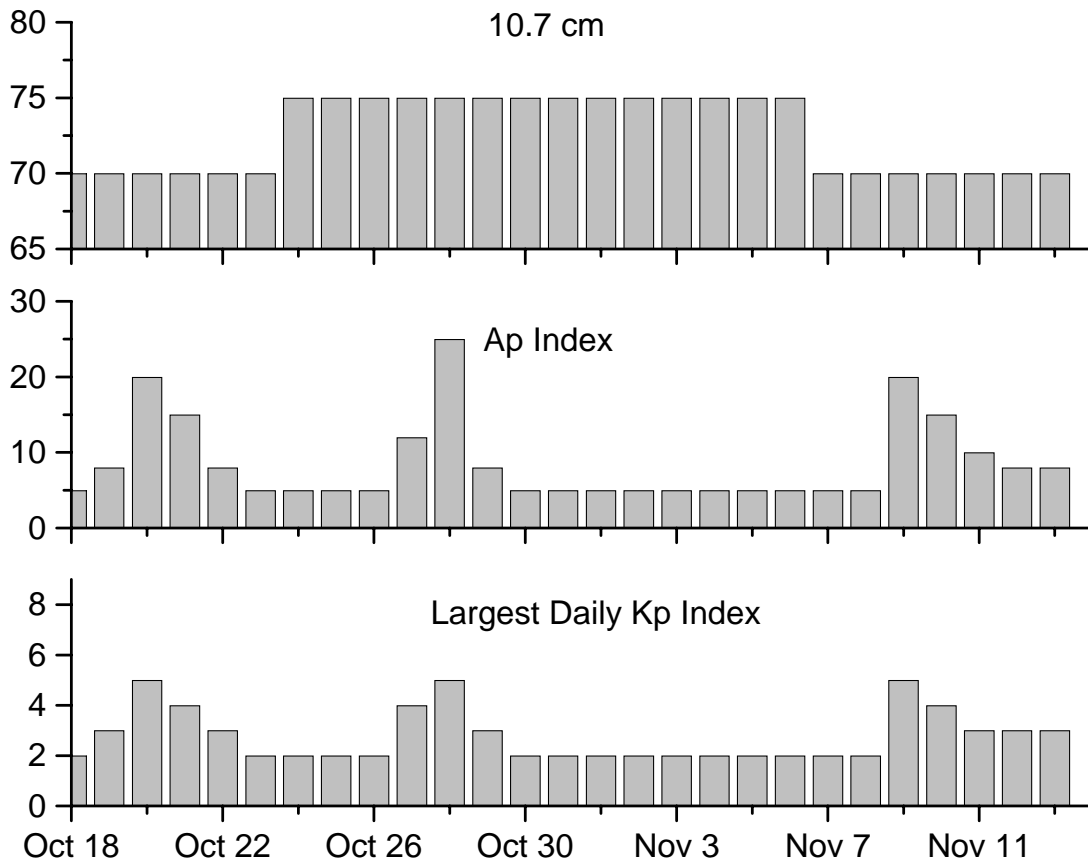


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
13 Oct 0612	WARNING: Geomagnetic K = 4	13 Oct 0645 – 1600
13 Oct 0707	ALERT: Geomagnetic K = 4	13 Oct 0705
13 Oct 0812	WARNING: Geomagnetic K = 5	13 Oct 0830 – 1200
13 Oct 1013	CANCEL WARNING: Geomagnetic K = 5	13 Oct 0830 – 1200
13 Oct 1551	EXTENDED WARNING: Geomagnetic K = 4	13 Oct 0645 – 2359
13 Oct 2354	EXTENDED WARNING: Geomagnetic K = 4	13 Oct 0645 – 14/1600
14 Oct 1420	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	14 Oct 1405
14 Oct 1554	EXTENDED WARNING: Geomagnetic K = 4	13 Oct 0645 – 14/2359
14 Oct 2354	EXTENDED WARNING: Geomagnetic K = 4	13 Oct 0645 – 15/1600
15 Oct 0502	ALERT: Electron 2MeV Integral Flux ≥ 1000 pfu	15 Oct 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
18 Oct	70	5	2	01 Nov	75	5	2
19	70	8	3	02	75	5	2
20	70	20	5	03	75	5	2
21	70	15	4	04	75	5	2
22	70	8	3	05	75	5	2
23	70	5	2	06	75	5	2
24	75	5	2	07	70	5	2
25	75	5	2	08	70	5	2
26	75	5	2	09	70	20	5
27	75	12	4	10	70	15	4
28	75	25	5	11	70	10	3
29	75	8	3	12	70	8	3
30	75	5	2	13	70	8	3
31	75	5	2				



Energetic Events

Date	Time		X-ray	Optical Information			Peak		Sweep Freq	
	1/2		Integ	Imp/	Location	Rgn	Radio Flux		Intensity	
	Begin	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II

No Events Observed

Flare List

Date	Time			Optical	Imp/	Location	Rgn
	Begin	Max	End	X-ray			
				Class.	Brtns	Lat CMD	
09 October	<i>No Flares Observed</i>						
10 October	<i>No Flares Observed</i>						
11 October	<i>No Flares Observed</i>						
12 October	<i>No Flares Observed</i>						
13 October	2038	2041	2043	B1.0			
14 October	0214	0218	0220	B1.3			
	0757	0805	0818	B1.2			
15 October	<i>No Flares Observed</i>						

Region Summary

Date	Location		Sunspot Characteristics											
	(° 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	3

Region 912

28 Sep	N06E65	193	0040	05	Bxo	003	B											
29 Sep	N03E52	193	0020	01	Axx	001	A											
30 Sep	N03E39	193																
01 Oct	N03E26	193																
02 Oct	N03E13	193																
03 Oct	N03E00	193																
04 Oct	N03W13	193																
05 Oct	N03W26	193																
06 Oct	N03W39	193																
07 Oct	N03W52	193																
08 Oct	N03W65	193																
09 Oct	N03W78	193																
10 Oct	N03W91	193																

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 193



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 913

28 Sep	S18E68	190	0060	03	Hsx	002	A												
29 Sep	S18E55	190	0070	03	Hsx	002	A												
30 Sep	S18E42	190	0060	03	Cso	003	Bg												
01 Oct	S19E27	191	0040	02	Cso	002	Bg												
02 Oct	S19E14	191	0050	03	Hsx	003	A												
03 Oct	S19E01	191	0050	02	Hax	002	A												
04 Oct	S19W12	191	0040	02	Hsx	002	A												
05 Oct	S20W23	189	0050	06	Cso	006	B												1
06 Oct	S21W37	189	0030	02	Hsx	002	A												
07 Oct	S19W51	189	0030	04	Cso	003	B												
08 Oct	S20W64	189	0020	01	Hsx	001	A												
09 Oct	S26W76	188	0030	01	Axx	001	A												
10 Oct	S26W89	188																	

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 191

Region 914

28 Sep	S07E75	183	0020	02	Axx	001	A												
29 Sep	S07E62	183	0050	03	Hrx	002	A												
30 Sep	S07E49	183	0030	01	Hsx	001	A												
01 Oct	S10E36	182	0030	01	Hsx	001	A												
02 Oct	S10E22	183	0020	01	Hsx	001	A												
03 Oct	S09E09	183	0010	01	Axx	001	A												
04 Oct	S09W04	183	0010	01	Hrx	001	A												
05 Oct	S10W18	184	0010	01	Hrx	001	A												
06 Oct	S12W31	183	0010	00	Axx	001	A												
07 Oct	S11W46	184	0020	01	Hrx	001	A												
08 Oct	S12W58	183	0010	01	Axx	001	A												
09 Oct	S12W71	183																	
10 Oct	S12W84	183																	
11 Oct	S12W97	183																	

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 183



Region Summary – continued

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

Region 916

10 Oct	S13W08	107	0010	01	Axx	001	A									
11 Oct	S13W21	107														
12 Oct	S13W34	107														
13 Oct	S13W47	107														
14 Oct	S13W60	107														
15 Oct	S13W73	107														

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 107

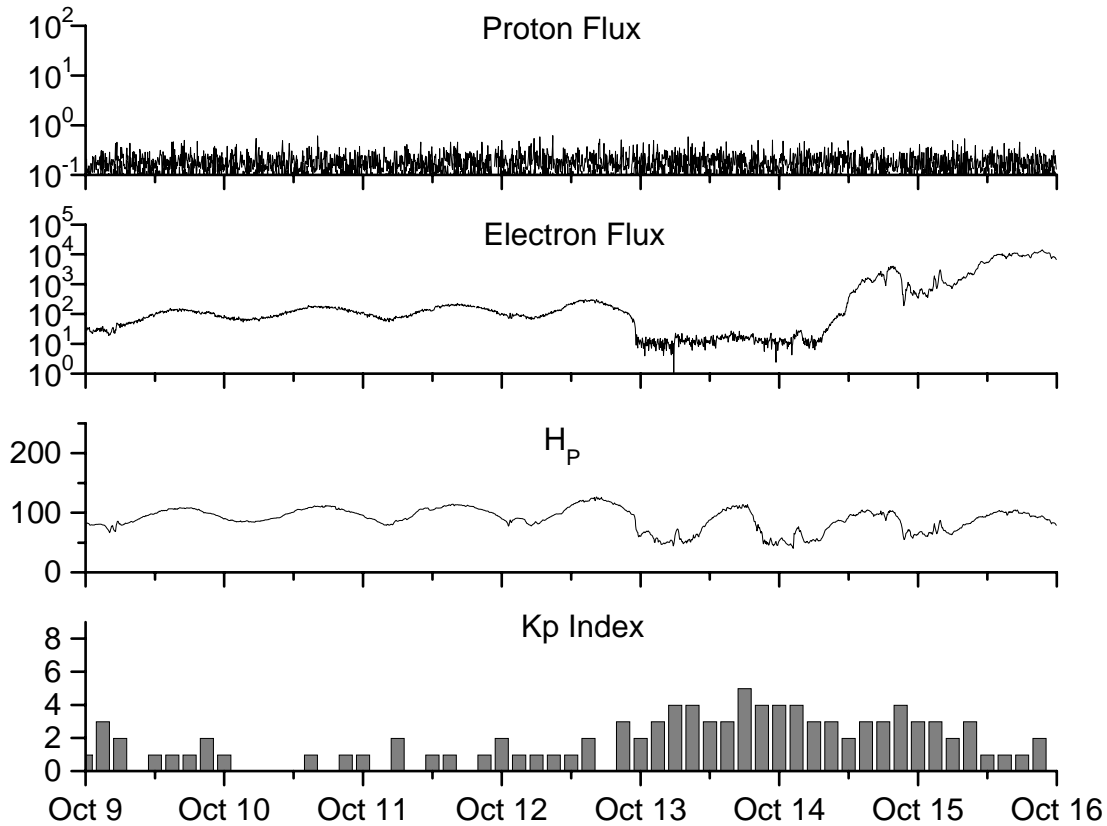


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
October	77.9	48.4	0.62	61.3	35.9	105.7	102.1	9	13.5
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			89.0		11	
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	

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 09 October 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.

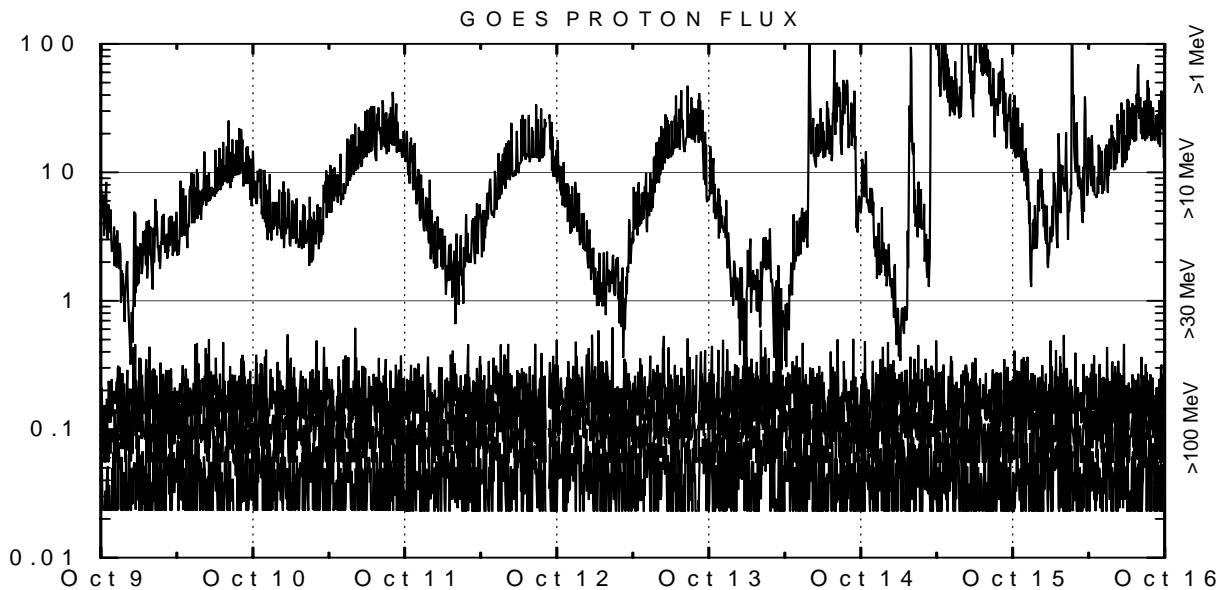
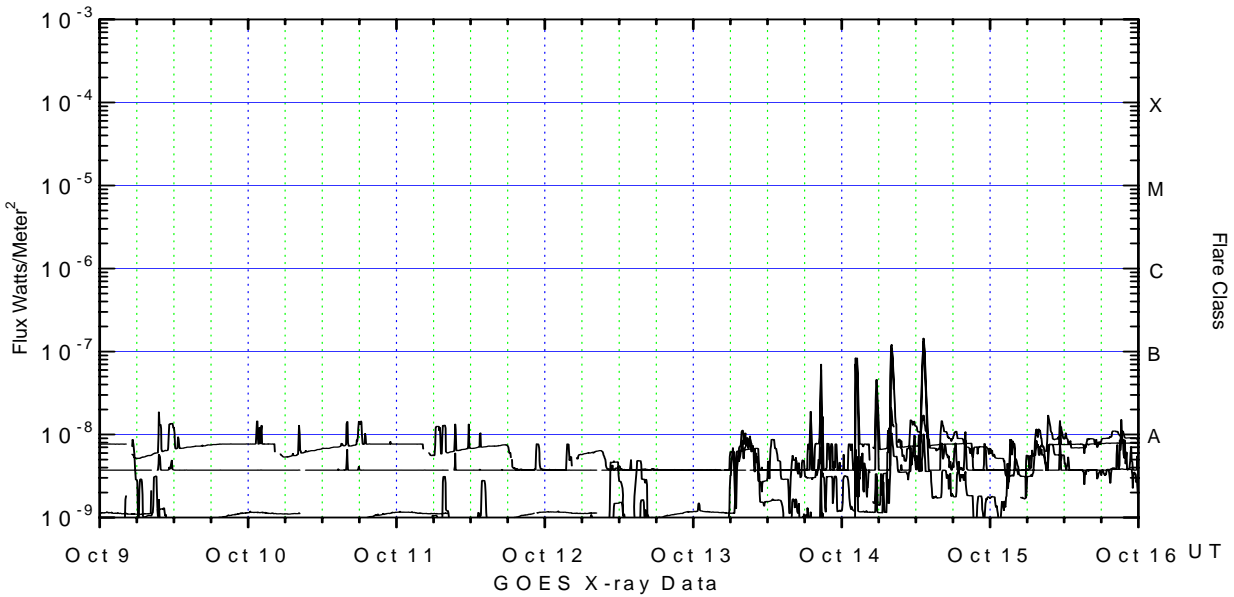
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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.

