

Space Weather Highlights
16 October – 22 October 2006

SEC PRF 1625
24 October 2006

Solar activity was at very low levels. Only a few low level B-class flares were observed during the period. New Region 917 (S05, L=346, class/area, Dac/200 on 22 October) formed on the disk on 19 October. By 22 October, this region grew to 200 millionths in area and was designated a beta gamma magnetic classification.

No greater than 10 MeV proton events were observed.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels on 16 – 22 October.

The geomagnetic field ranged from quiet to minor storm levels. The period began under the waning influence of a coronal hole high speed stream. Solar wind speed at ACE was decreasing from approximately 515 km/s while the IMF Bz was fluctuating between +/- 3 nT. The geomagnetic field was quiet to unsettled at middle latitudes while high latitudes observed a few active periods. Solar wind speed continued to decline to a minimum of 300 km/s late on 19 October. Geomagnetic conditions were quiet during this time. Early on 20 October, density, temperature, and wind speed increased; all indicative of a co-rotating interaction region in advance of a coronal hole high speed stream. The IMF Bz began fluctuating between +/- 10 nT and the geomagnetic field responded with quiet to unsettled conditions at middle latitudes with quiet to active conditions at higher latitudes. Solar wind speed continued to increase to approximately 670 km/s by midday on 21 October while the IMF Bz had calmed, not varying much beyond +/- 3 nT. The geomagnetic field at middle latitudes was quiet to unsettled with quiet to minor storm conditions observed at high latitudes on 21 October. By 22 October, solar wind speed was still elevated, but decreasing. Unsettled to active levels were observed at middle latitudes while quiet to minor storm conditions were observed at high latitudes.

Space Weather Outlook
25 October – 20 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 25 – 26 October, 28 October – 03 November, and 10 – 20 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 28 October, 09 – 10 November, and again on 17 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	
16 October	70	0	0	<A1.0	0	0	0	0	0	0	0	0	0
17 October	70	0	0	<A1.0	0	0	0	0	0	0	0	0	0
18 October	70	0	0	<A1.0	0	0	0	0	0	0	0	0	0
19 October	70	14	30	<A1.0	0	0	0	0	0	0	0	0	0
20 October	71	15	30	<A1.0	0	0	0	1	0	0	0	0	0
21 October	75	16	70	<A1.0	0	0	0	0	0	0	0	0	0
22 October	76	18	200	A3.7	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
	16 October	9.7E+5	1.7E+4	4.2E+3		9.0E+8
17 October	7.3E+5	1.6E+4	4.3E+3		7.0E+8	
18 October	7.5E+5	1.7E+4	4.2E+3		7.5E+8	
19 October	9.6E+5	1.7E+4	4.4E+3		7.7E+8	
20 October	1.1E+6	1.8E+4	4.1E+3		9.1E+7	
21 October	5.8E+6	1.6E+4	3.3E+3		1.8E+7	
22 October	1.9E+6	1.6E+4	3.7E+3		9.0E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	16 October	7	3-1-2-1-2-1-1-3	13	1-1-2-3-4-3-1-4	8
17 October	2	2-0-0-1-1-0-1-0	2	1-0-1-2-1-1-0-0	2	1-0-0-1-0-0-1-0
18 October	2	2-2-1-0-0-0-1-0	3	0-1-1-2-2-0-0-0	4	1-2-1-0-0-0-1-1
19 October	1	0-1-0-1-1-0-0-0	1	0-0-0-2-0-0-0-0	2	0-1-0-1-1-0-0-1
20 October	9	2-0-2-2-3-2-3-3	10	2-0-1-3-4-3-2-2	10	2-0-1-2-3-3-3-3
21 October	10	3-2-3-2-2-3-2-2	25	3-3-3-5-5-5-2-2	15	3-2-3-3-3-4-3-2
22 October	12	2-4-2-2-3-2-2-3	19	3-3-5-1-4-4-2-2	13	2-5-3-1-2-2-3-3

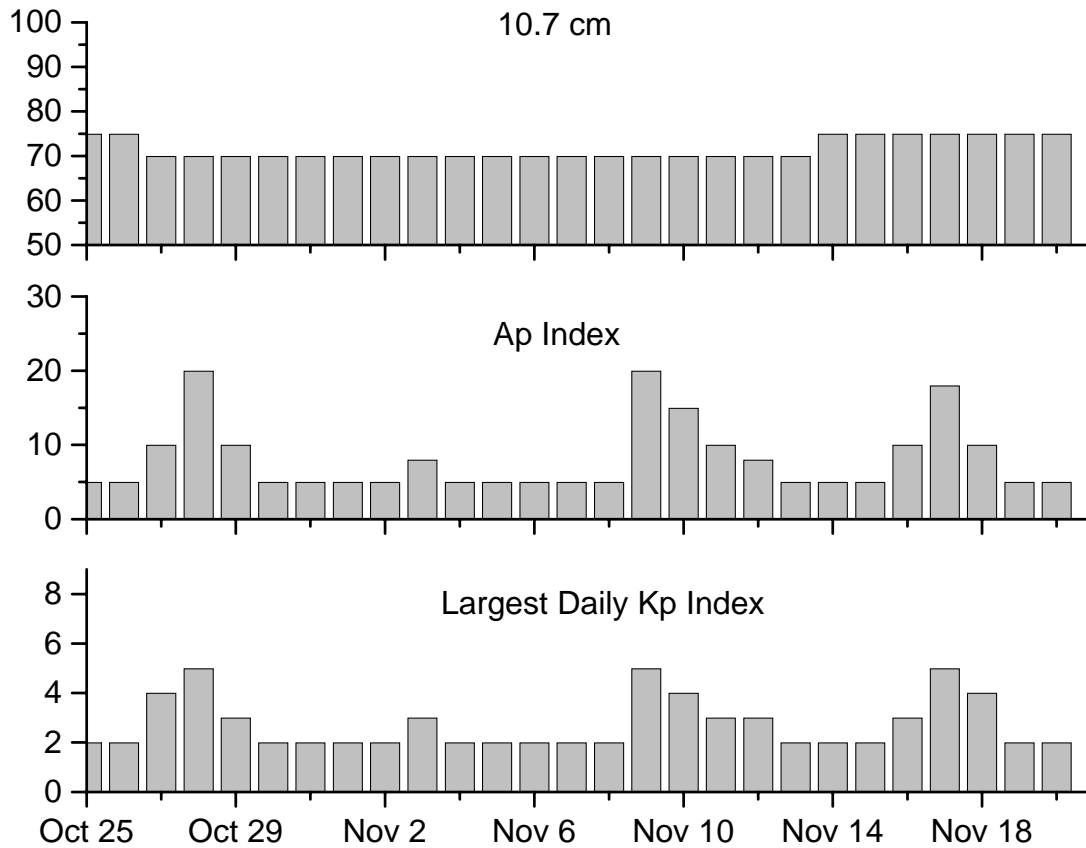


Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
16 Oct 0504	ALERT: Electron 2MeV Integral Flux >1000pfu	16 Oct 0500
17 Oct 0503	ALERT: Electron 2MeV Integral Flux >1000pfu	17 Oct 0500
18 Oct 0532	ALERT: Electron 2MeV Integral Flux >1000pfu	18 Oct 0500
19 Oct 0510	ALERT: Electron 2MeV Integral Flux >1000pfu	19 Oct 0500
20 Oct 0103	WARNING: Geomagnetic K=4	20 Oct 0200 – 1600
20 Oct 0513	ALERT: Electron 2MeV Integral Flux >1000pfu	20 Oct 0500
20 Oct 1522	EXTENDED WARNING: Geomagnetic K=4	20 Oct 0200 – 21/1600
20 Oct 1639	ALERT: Geomagnetic K=4	20 Oct 1639
21 Oct 1543	EXTENDED WARNING: Geomagnetic K=4	20 Oct 0200 – 22/1600
21 Oct 1846	ALERT: Electron 2MeV Integral Flux >1000pfu	21 Oct 1825
22 Oct 0448	ALERT: Geomagnetic K=5	22 Oct 0445
22 Oct 1036	ALERT: Electron 2MeV Integral Flux >1000pfu	22 Oct 1020



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
25 Oct	75	5	2	08 Nov	70	5	2
26	75	5	2	09	70	20	5
27	70	10	4	10	70	15	4
28	70	20	5	11	70	10	3
29	70	10	3	12	70	8	3
30	70	5	2	13	70	5	2
31	70	5	2	14	75	5	2
01 Nov	70	5	2	15	75	5	2
02	70	5	2	16	75	10	3
03	70	8	3	17	75	18	5
04	70	5	2	18	75	10	4
05	70	5	2	19	75	5	2
06	70	5	2	20	75	5	2
07	70	5	2				



Energetic Events

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

No Events Observed

Flare List

Date	Time			Optical	Imp/ Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
16 October	No Flares Observed						
17 October	No Flares Observed						
18 October	No Flares Observed						
19 October	No Flares Observed						
20 October	1920	1921	1931		Sf	S06W16	917
21 October	No Flares Observed						
22 October	0654	0701	0718	B6.5			
	0841	0844	0846	B1.6			
	1107	1110	1112	B1.0			
	1319	1326	1332	B2.9			
	1743	1749	1756	B2.8			
	1809	1812	1815	B1.0			



Region Summary

Location		Sunspot Characteristics												
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 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											
16 Oct	S13W86	107											

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 107

Region 917

19 Oct	S05W04	344	0030	04	Bxo	004	B						
20 Oct	S05W20	347	0030	04	Bxo	005	B						1
21 Oct	S05W33	347	0070	04	Cso	006	B						
22 Oct	S05W46	346	0200	08	Dac	008	Bg						

0 0 0 1 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 344

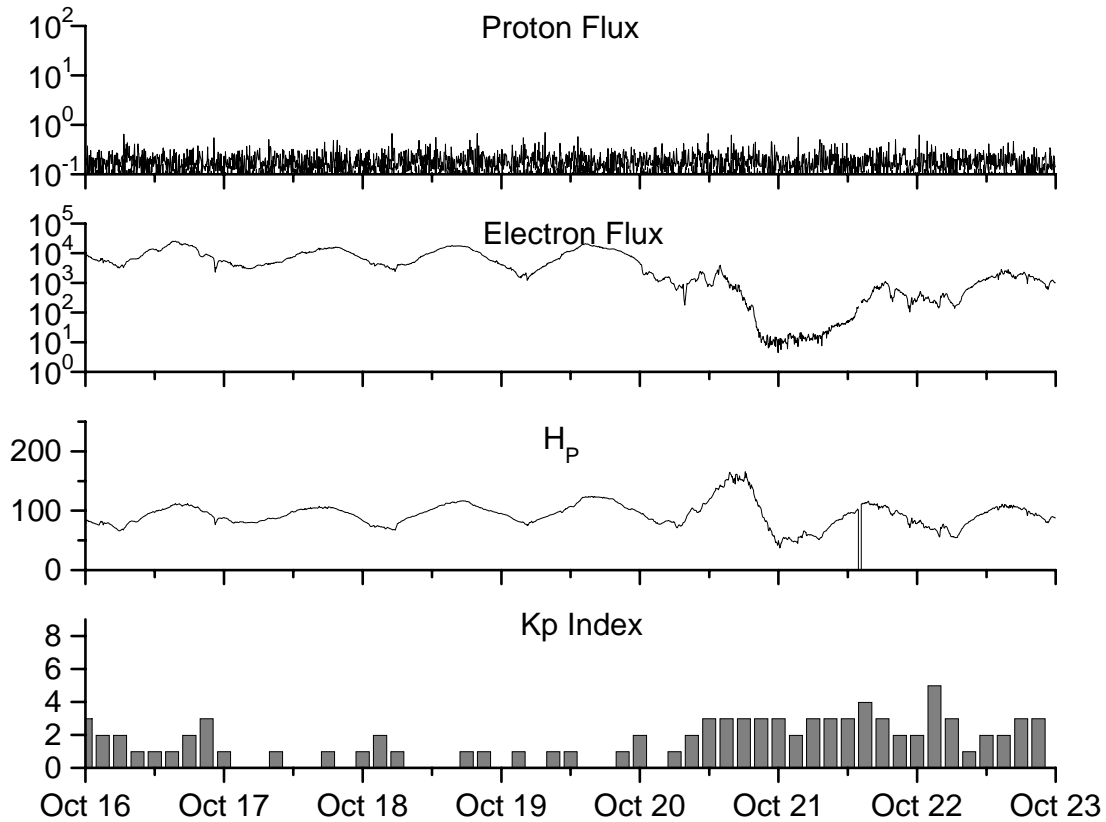


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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 16 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.

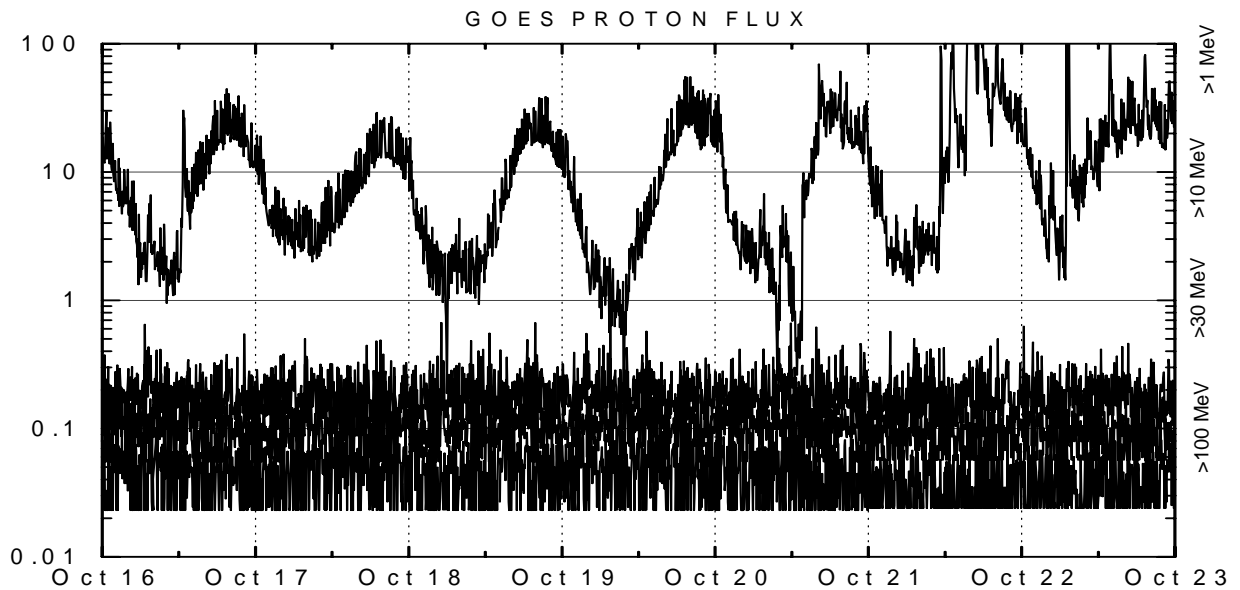
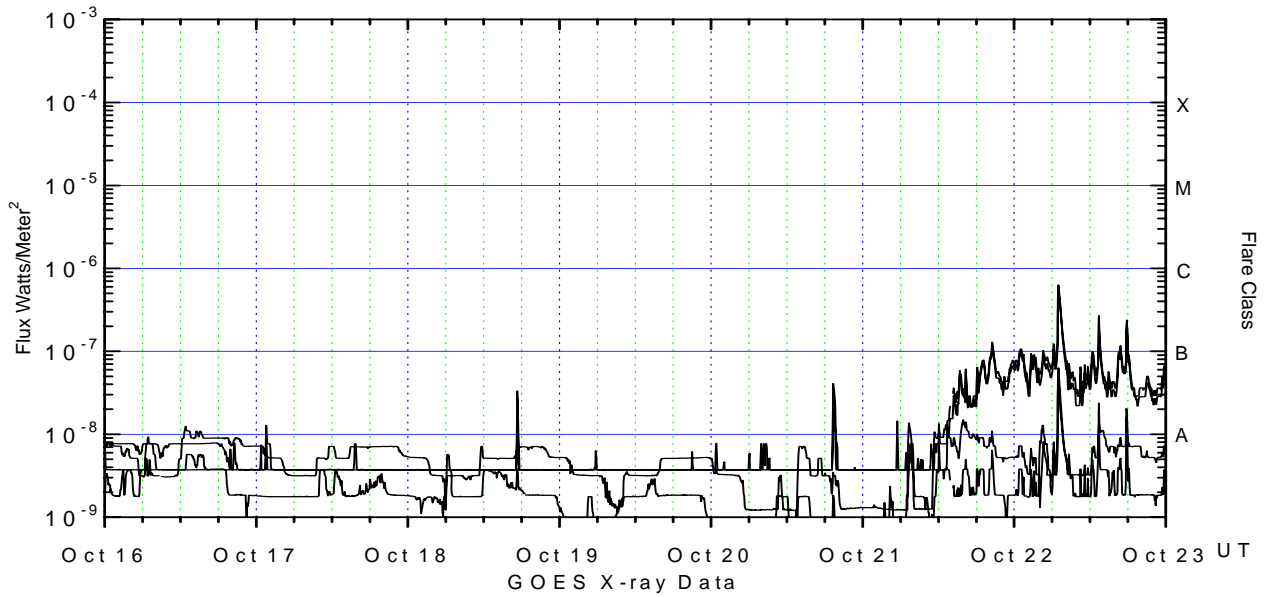
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-12 (W075).

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.

