

**Space Weather Highlights**  
**09 April – 15 April 2007**

**SEC PRF 1650**  
**17 April 2007**

Solar activity was very low. No flares were observed during the period. The only numbered region that appeared on the visible solar disk was Region 951 (S12, L=137, class/area, Axx/010 on 14 April).

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during 09 – 10 April.

The geomagnetic field was at quiet to unsettled levels at middle latitudes while high latitudes ranged from quiet to minor storm levels. The period began as a recurrent coronal hole high speed stream moved into a geoeffective position. Solar wind speed at ACE initially increased to approximately 490 km/s, while the IMF Bz fluctuated between +11 to -8 nT by midday on 09 April. The geomagnetic field responded with unsettled to active conditions at high latitudes while middle latitudes observed quiet to unsettled conditions. Solar wind speed declined slightly early on 10 April before increasing again to a maximum of 560 km/s early on 12 April. The IMF Bz fluctuated between +9 to -6 nT just after midday on 10 April, causing unsettled conditions in the geomagnetic field. By 11 April through early on 12 April, the IMF Bz did not vary much between +/-3 nT. By midday on 12 April, a prolonged period of southward Bz caused minor storm conditions at high latitudes, while only quiet to unsettled conditions were observed at middle latitudes. Thereafter, until the end of the period, the solar wind speed declined to background levels. The geomagnetic field was quiet at middle and high latitudes.

**Space Weather Outlook**  
**18 April – 14 May 2007**

Solar activity is expected to continue at very low levels.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 18 April and again during 29 April – 07 May.

Geomagnetic field activity is expected to be at quiet to unsettled levels through 19 April. A recurrent coronal hole high-speed stream is expected to disturb the field during 20 – 21 April. Predominantly unsettled to minor storm levels are expected with isolated major storm periods possible. Quiet to unsettled conditions are expected during 22 – 27 April. Another round of coronal hole effects is expected during 28 – 29 April with unsettled to major storm conditions expected. Mostly quiet conditions are expected for the balance of the period.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
09 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
10 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
11 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
12 April	68	0	0	<A1.0	0	0	0	0	0	0	0	0
13 April	68	0	0	<A1.0	0	0	0	0	0	0	0	0
14 April	68	11	10	<A1.0	0	0	0	0	0	0	0	0
15 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
09 April	1.5E+6	1.7E+4	3.9E+3		6.7E+7	
10 April	1.8E+6	1.7E+4	3.8E+3		6.2E+7	
11 April	8.7E+5	1.8E+4	3.7E+3		1.2E+7	
12 April	3.5E+6	1.7E+4	3.6E+3		2.2E+7	
13 April	1.8E+6	1.8E+4	3.9E+3		1.4E+7	
14 April	2.2E+6	1.7E+4	4.0E+3		1.7E+7	
15 April	1.1E+6	1.8E+4	4.2E+3		7.7E+6	

### *Daily Geomagnetic Data*

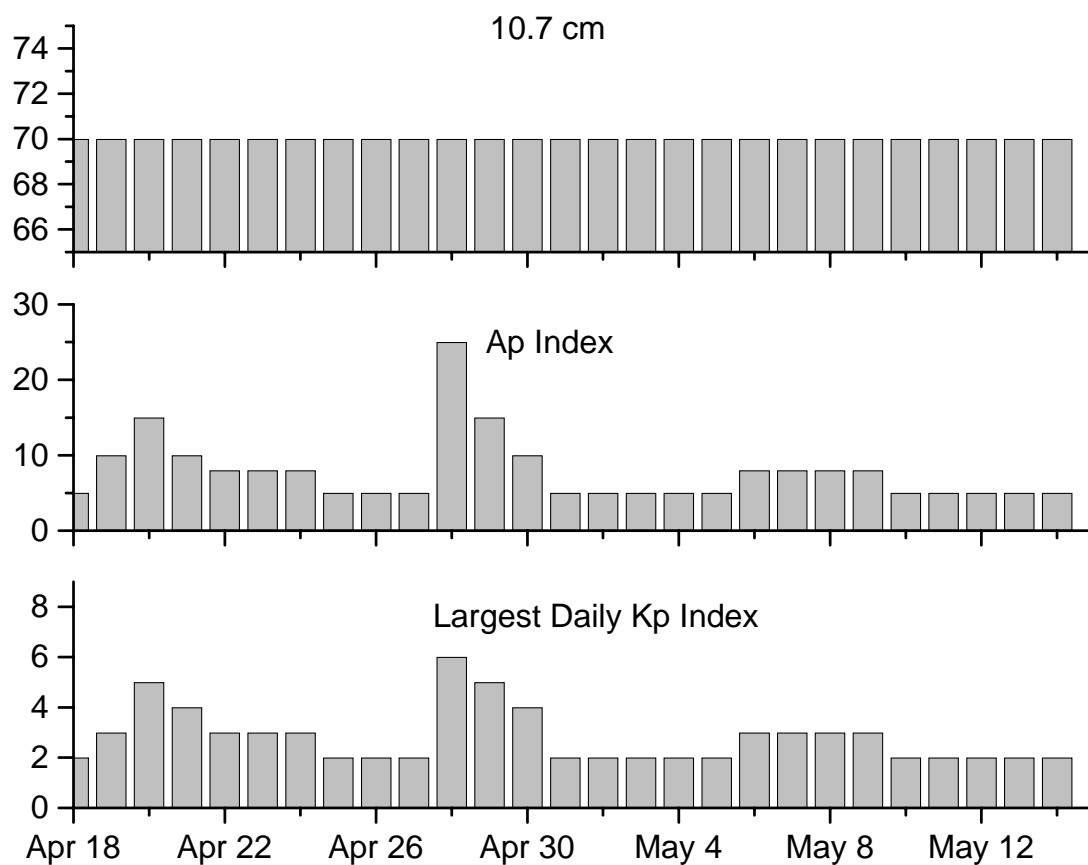
Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
09 April	8	3-3-3-2-1-1-1-1	11	3-3-3-4-3-0-0-1	9	4-3-3-1-1-0-1-1
10 April	6	2-0-0-2-3-2-1-2	6	1-0-0-3-3-2-2-1	7	2-0-0-1-2-3-2-3
11 April	3	1-2-1-1-0-0-1-1	2	1-1-1-0-0-0-0-1	4	2-2-1-0-0-1-0-1
12 April	7	2-2-1-2-3-2-1-1	15	2-2-1-5-5-2-1-0	8	2-2-1-3-3-2-2-1
13 April	1	0-0-1-1-0-0-0-0	0	1-0-0-0-0-0-0-0	2	1-0-1-0-0-0-0-1
14 April	3	0-1-1-0-2-1-0-2	2	0-1-1-0-0-1-0-1	4	0-1-0-0-1-2-1-3
15 April	2	1-1-1-1-1-1-0-0	4	1-2-2-2-1-1-1-0	4	2-2-1-1-1-1-0-0

### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
09 Apr 0230	ALERT: Geomagnetic K = 4	09 Apr 0229
09 Apr 1131	ALERT: Electron 2MeV Integral Flux ≥1000pfu	09 Apr 1105
10 Apr 1151	ALERT: Electron 2MeV Integral Flux ≥1000pfu	10 Apr 1135



## 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 Apr	70	5	2	02 May	70	5	2
19	70	10	3	03	70	5	2
20	70	15	5	04	70	5	2
21	70	10	4	05	70	5	2
22	70	8	3	06	70	8	3
23	70	8	3	07	70	8	3
24	70	8	3	08	70	8	3
25	70	5	2	09	70	8	3
26	70	5	2	10	70	5	2
27	70	5	2	11	70	5	2
28	70	25	6	12	70	5	2
29	70	15	5	13	70	5	2
30	70	10	4	14	70	5	2
01 May	70	5	2				



### ***Energetic Events***

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

***No Events Observed***

### ***Flare List***

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			

09 April ***No Flares Observed***

10 April ***No Flares Observed***

11 April ***No Flares Observed***

12 April ***No Flares Observed***

13 April ***No Flares Observed***

14 April ***No Flares Observed***

15 April ***No Flares Observed***

### ***Region Summary***

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

#### ***Region 951***

14 Apr S12E31    137    0010    01    Axx    001    A

15 Apr S12E18    137

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 137

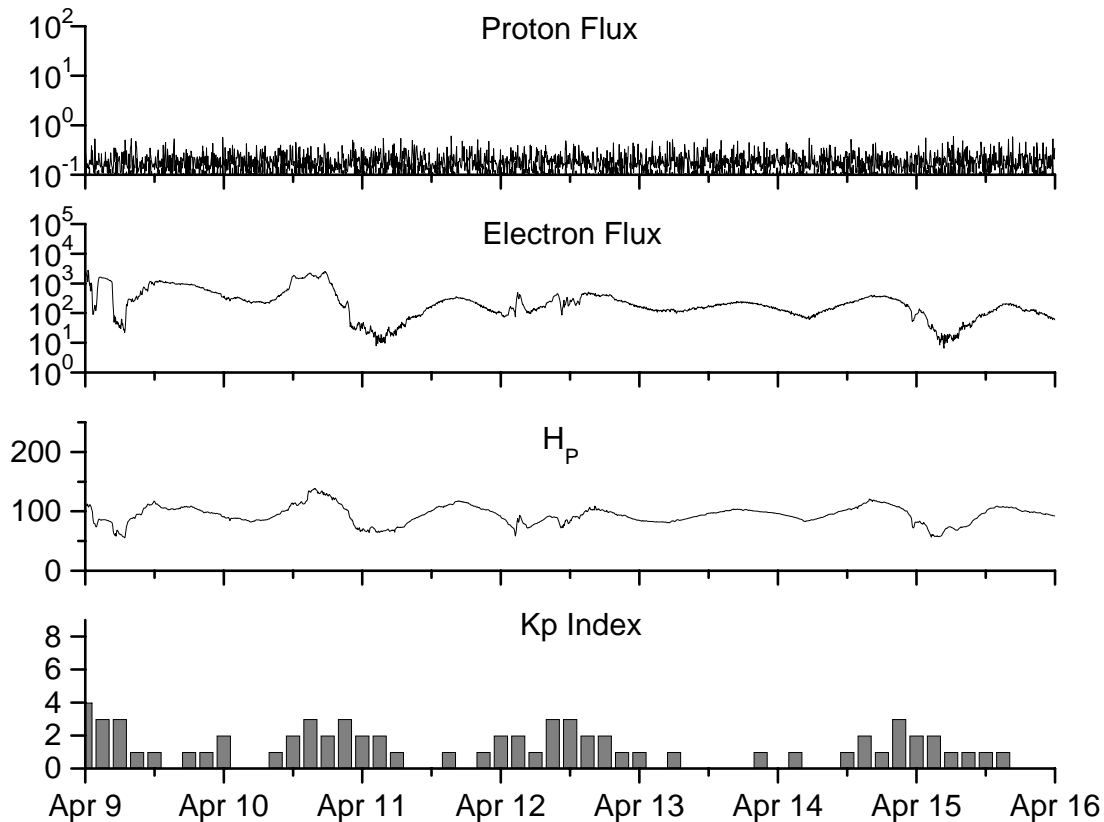


**Recent Solar Indices (preliminary)  
of the observed monthly mean values**

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	<u>Observed values</u> SEC	<u>Ratio</u> RI	<u>Ratio</u> RI/SEC	<u>Smooth values</u> SEC	<u>Smooth values</u> RI	<u>*Penticton</u> 10.7 cm	<u>Smooth</u> Value	<u>Planetary</u> Ap	<u>Smooth</u> Value
2005									
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	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	9	8.3
July	22.6	12.2	0.54	27.2	15.3	75.8	80.3	7	8.7
August	22.8	12.9	0.57	27.6	15.6	79.0	80.3	9	8.7
September	25.2	14.5	0.58	27.7	15.6	77.8	80.2	8	8.7
October	15.7	10.4	0.66			74.3		8	
November	31.5	21.5	0.68			86.4		9	
December	22.2	13.6	0.61			84.3		15	
2007									
January	26.6	16.9	0.64			83.5		6	
February	17.2	10.6	0.62			77.8		6	
March	9.7	4.8	0.49			72.3		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 09 April 2007*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>–sec–sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

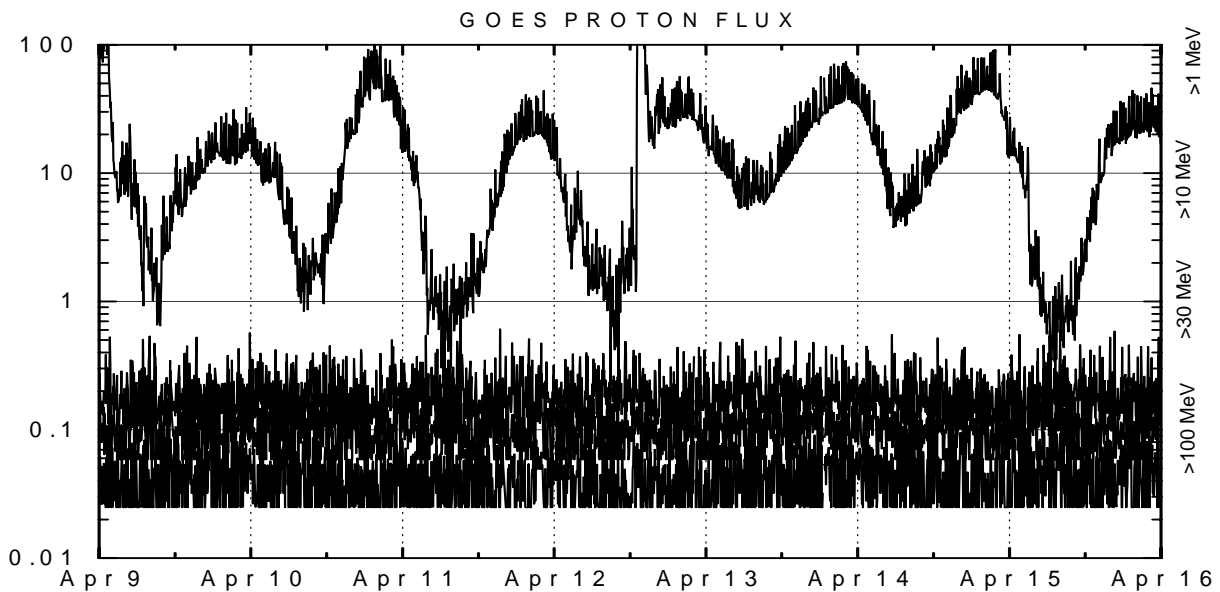
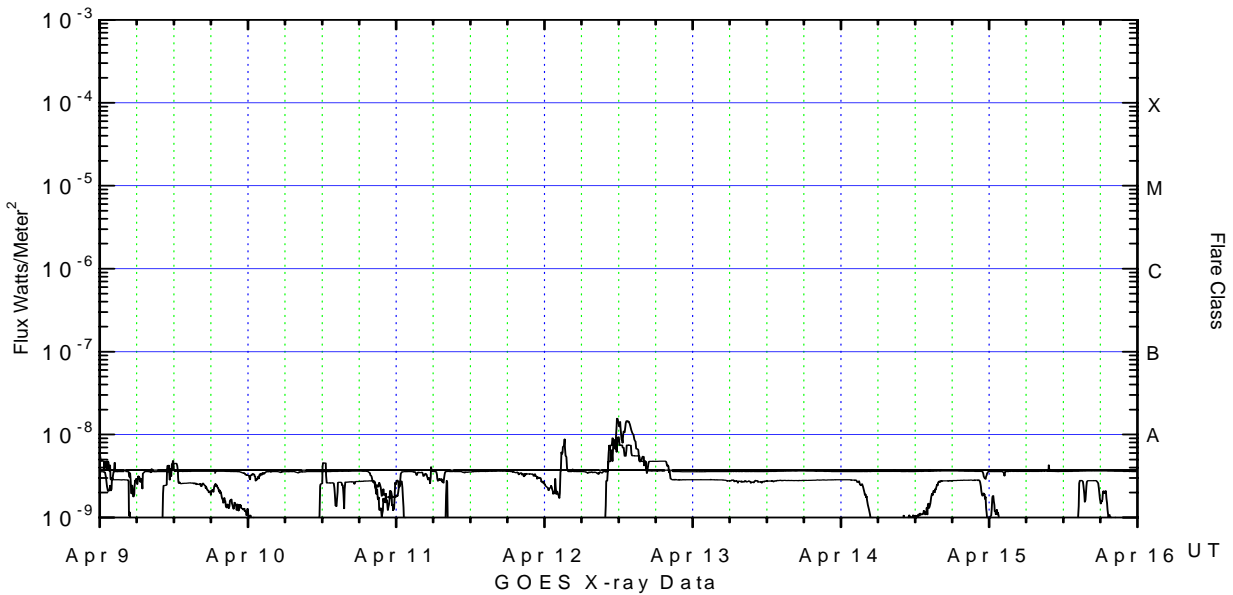
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>–sec–sr) with energies greater than 2 MeV at GOES-12 (W075).

*H<sub>p</sub>* 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<sub>p</sub>* 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<sub>p</sub> 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<sub>p</sub> 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/m<sup>2</sup>) as measured by GOES 10 (W060) 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/cm<sup>2</sup>-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/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

