

Space Weather Highlights
06 - 12 April 2009

SWO PRF 1754
14 April 2009

Solar activity was very low. No flares were observed. The visible disk was spotless.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels 11 - 12 April.

The summary period began with solar wind speeds at about 400 km/s. Velocities slowly decreased to about 300 km/s by late on 08 April. At about 08/2015 UTC, solar wind speeds indicated a fairly sharp rise in velocity to about 475 km/s by 09/0300 UTC. From that time forward, wind speeds gradually increased to near 570 km/s by 11/1700 UTC and subsequently, speeds gradually decreased to about 500 km/s by the end of the summary period. From late on 08 April to late on 09 April, the Bz component of the IMF varied between +7 to -7 nT. Otherwise, Bz did not vary much beyond +/- 3 nT. This increase in wind speed and IMF variability was due to a recurrent coronal hole high speed stream. The geomagnetic field responded with quiet to unsettled periods at middle latitudes, while high latitudes observed quiet to active conditions with the one isolated minor storm period observed midday on 11 April. The period ended with quiet levels across all latitudes.

Space Weather Outlook
15 April - 11 May 2009

Solar activity is expected to be very low.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to increase to high levels during 08 - 12 May. Normal flux levels are expected during the rest of the period.

Geomagnetic field activity is expected to be at mostly quiet levels through 20 April. Activity is expected to increase to quiet to unsettled levels during 21 - 22 April due to a recurrent coronal hole high-speed stream. Activity is expected to decrease to quiet levels during 23 April to 05 May. Activity is expected to increase to quiet to unsettled levels during 06 - 09 May with active levels possible on the 6th, all due to another recurrent coronal hole high speed stream. Activity is expected to decrease to mostly quiet levels during 10 - 11 May.



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 April	69	0	0	<A1.0	0	0	0	0	0	0	0	0
07 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
08 April	70	0	0	<A1.0	0	0	0	0	0	0	0	0
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	69	0	0	<A1.0	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
	06 April	5.4e+05	2.0e+04	4.6e+03		1.1e+06
07 April	4.6e+05	1.9e+04	4.3e+03		8.8e+05	
08 April	5.5e+05	1.9e+04	4.3e+03		8.0e+05	
09 April	7.1e+05	1.9e+04	4.2e+03		9.5e+04	
10 April	1.2e+06	1.9e+04	4.1e+03		1.3e+07	
11 April	1.8e+06	1.9e+04	4.1e+03		6.4e+07	
12 April	1.1e+06	1.8e+04	4.4e+03		2.4e+08	

Daily Geomagnetic Data

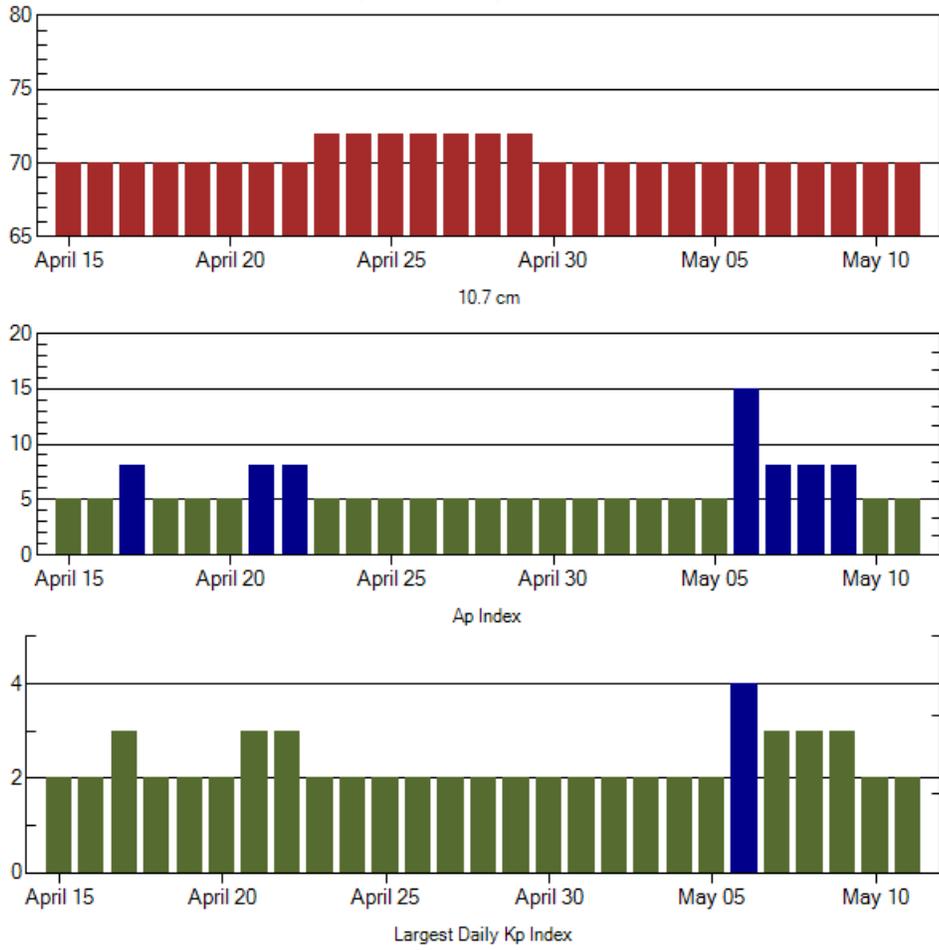
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 April	2	0-0-0-2-1-1-1-1	1	0-0-0-0-0-1-0-1	3
07 April	2	0-0-1-1-1-0-1-1	1	0-0-1-1-0-0-0-0	2	0-0-1-1-1-0-0-1
08 April	4	0-1-1-1-2-1-2-1	3	1-2-0-1-1-0-1-1	5	0-0-1-1-2-2-2-2
09 April	9	2-3-3-1-2-2-2-2	12	1-3-3-4-2-3-2-1	12	3-4-3-2-1-3-2-2
10 April	6	2-1-2-2-2-1-2-1	8	1-1-3-3-3-2-2-0	8	2-2-2-2-1-1-3-2
11 April	7	3-1-2-1-2-2-1-2	16	2-2-2-5-4-4-1-1	9	3-2-2-2-2-2-1-3
12 April	4	2-2-2-0-0-1-1-2	3	1-2-2-1-1-0-0-1	8	2-2-2-1-1-2-2-3

Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
11 Apr 0146	WARNING: Geomagnetic K = 4	11 Apr 0147 - 1600
11 Apr 1556	ALERT: Electron 2MeV Integral Flux >= 1000pfu	11 Apr 1540
11 Apr 0135	ALERT: Geomagnetic K = 4	11 Apr 0128
12 Apr 1215	ALERT: Electron 2MeV Integral Flux >= 1000pfu	12 Apr 0900



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 Apr	70	5	2	29 Apr	72	5	2
16	70	5	2	30	70	5	2
17	70	8	3	01 May	70	5	2
18	70	5	2	02	70	5	2
19	70	5	2	03	70	5	2
20	70	5	2	04	70	5	2
21	70	8	3	05	70	5	2
22	70	8	3	06	70	15	4
23	72	5	2	07	70	8	3
24	72	5	2	08	70	8	3
25	72	5	2	09	70	8	3
26	72	5	2	10	70	5	2
27	72	5	2	11	70	5	2
28	72	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			X-ray Class.	Imp / Brtns	Optical	Rgn
	Begin	Max	End			Location Lat CMD	
06 April	No Flares Observed						
07 April	No Flares Observed						
08 April	No Flares Observed						
09 April	No Flares Observed						
10 April	No Flares Observed						
11 April	No Flares Observed						
12 April	No Flares Observed						

Region Summary

Date	Location		Sunspot Characteristics				Flares				
	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

No active regions.



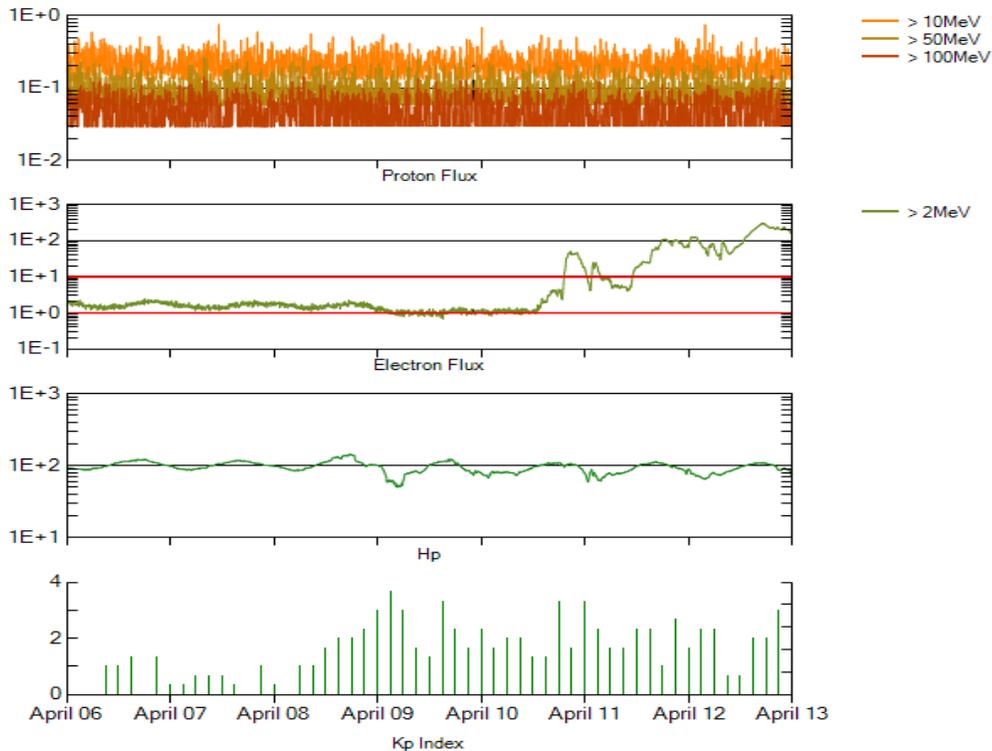
Recent Solar Indices (preliminary)
Of the observed monthly mean values

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed SEC	values RI	Ratio RI/SEC	Smooth SEC	values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2007									
April	6.9	3.7	0.54	16.0	9.9	72.4	75.2	9	8.5
May	19.4	11.7	0.60	14.2	8.7	74.5	74.2	9	8.4
June	20.0	12.0	0.60	12.8	7.7	73.7	73.2	7	7.8
July	15.6	10.0	0.64	11.6	7.0	71.6	72.5	8	7.4
August	9.9	6.2	0.63	10.2	6.1	69.2	71.8	7	7.6
September	4.8	2.4	0.50	9.9	5.9	67.1	71.5	9	7.8
October	1.3	0.9	0.70	10.0	6.1	65.5	71.5	9	7.9
November	2.5	1.7	0.68	9.4	5.7	69.7	71.1	5	7.8
December	16.2	10.1	0.62	8.1	5.0	78.6	70.5	4	7.8
2008									
January	5.1	3.4	0.67	6.9	4.2	72.1	70.0	6	7.7
February	3.8	2.1	0.55	5.9	3.6	71.2	69.6	9	7.6
March	15.9	9.3	0.58	5.3	3.3	72.9	69.5	10	7.4
April	4.9	2.9	0.59	5.3	3.3	70.3	69.6	9	7.1
May	5.7	2.9	0.51	5.7	3.5	68.4	69.7	6	6.9
June	4.2	3.1	0.74	5.2	3.2	65.9	69.2	7	6.8
July	1.0	0.5	0.50	4.5	2.7	65.8	68.8	6	6.6
August	0.0	0.5	**	4.4	2.6	66.4	68.6	5	6.2
September	1.5	1.1	0.73	3.7	2.2	67.1	68.4	5	5.8
October	5.2	2.9	0.56			68.3		6	
November	6.8	4.1	0.60			68.6		3	
December	1.3	0.8	0.62			69.2		2	
2009									
January	2.8	1.5	0.54			69.8		3	
February	2.5	1.4	0.56			70.0		4	
March	0.7	0.7	1.00			69.2		4	

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.

**SWPC sunspot number was less than RI value, so a ratio could not be done.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 06 April 2009*

GOES-11 designated Primary Electron Satellite and GOES-10 Secondary: December 1, 2008 the GOES-12 Electron sensor began experiencing periods of noise and sensor is unreliable.

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.

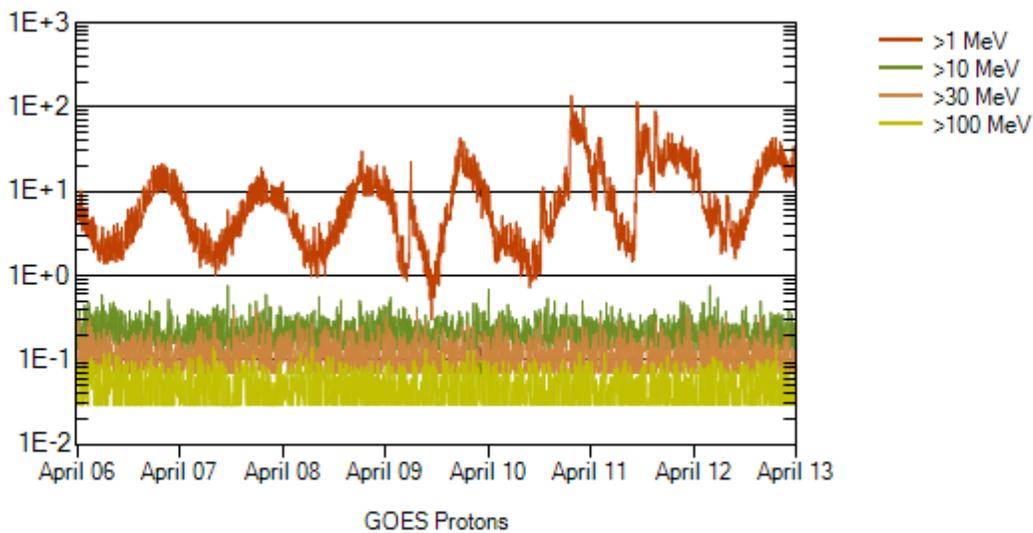
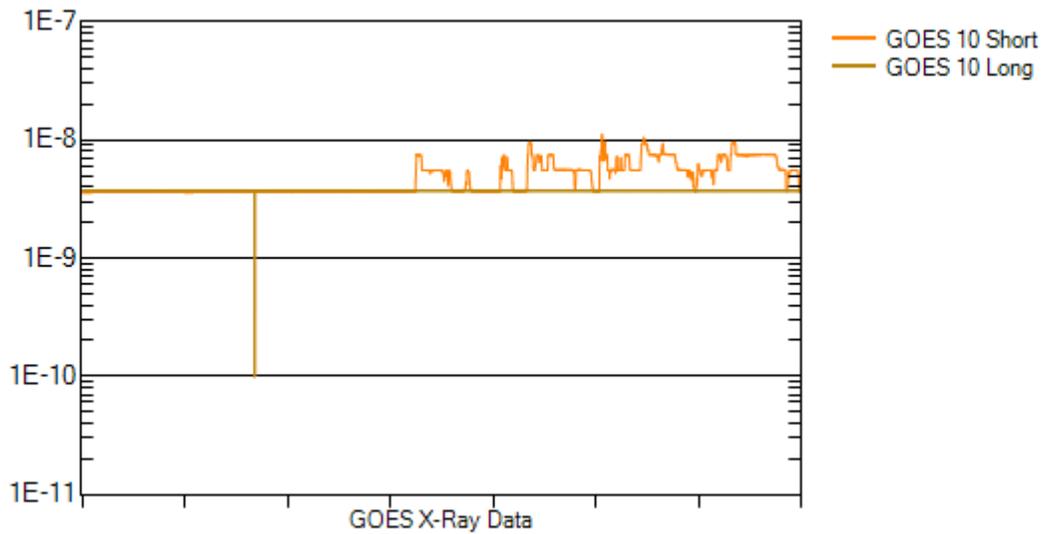
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-11 (W135).

Hp plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-11. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp 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 Kp values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWPC 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 Kp 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^2) 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 ($\text{protons/cm}^2\text{-sec-sr}$) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu ($\text{protons/cm}^2\text{-sec-sr}$) at greater than 10 MeV.

