

Solar activity was at very low levels on 04-05 April with low levels observed from 06-10 April as Region 2529 (N09, L=341, class/area, Eki/820 on 10 April) began its transit across the solar disk. The region emerged as a large bipolar group that produced 15 low level C-class flares during the period. The largest flare was a long-duration C2 at 09/1342 UTC, however it also produced another long-duration C1 flare at 10/0934 UTC. Other activity included a 10 degree filament eruption, centered near N18E29, that erupted beginning at approximately 10/1000 UTC. An associated CME was observed off the NE limb at 10/1100 UTC. The CME is currently being analyzed, however it is likely that little to no impacts will occur given its location and direction.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels from 04-07 April with normal levels observed from 08-10 April. The highest flux value observed for the period was 3,924 pfu at 05/1605 UTC.

Geomagnetic field activity ranged from quiet to (G1) minor storm levels. Solar wind parameters were at mostly nominal levels through the period until a solar sector boundary crossing (SSBC) occurred around 07/1737 UTC. During this time, total field increased to a maximum of 13 nT while the Bz component deflected southward for approximately 8 hours reaching a maximum of -13 nT. The geomagnetic field responded with G1-minor storm levels late on 07 April through early on 08 April.

## **Space Weather Outlook**

### **11 April - 07 May 2016**

Solar activity is expected to be at low levels with a slight chance for M-class (R1-R2, Minor-Moderate) flares until Region 2529 rotates off the NW limb on 21 April. Very low levels are expected from 22 April through 03 May. Low levels are expected once again from 04-07 May with the return of Region 2529.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 15-18, 24-28, and 30 April - 02 May due to coronal hole high speed stream (CH HSS) influence. Normal to moderate levels are expected for the remainder of the outlook period.

Geomagnetic field activity is expected to be at unsettled to active levels on 12-15, 23-26, and 29-30 April with G1-minor storm levels likely on 13-14 and 29 April due to recurrent CH HSS activity. Unsettled to active levels are also likely on 04 May due to activity associated with an SSBC.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux		Flares						
						X-ray			Optical			
						C	M	X	S	1	2	3
04 April	83	23	160	A9.3	0	0	0	1	0	0	0	0
05 April	83	27	150	A7.6	0	0	0	1	0	0	0	0
06 April	87	13	20	B2.2	2	0	0	0	0	0	0	0
07 April	92	26	370	B3.5	3	0	0	0	0	0	0	0
08 April	98	27	360	B3.2	1	0	0	0	0	0	0	0
09 April	106	29	830	B3.9	8	0	0	14	0	0	0	0
10 April	111	26	820	B5.2	2	0	0	3	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	>0.6 MeV	>2MeV	>4 MeV
	04 April	1.7e+05	1.3e+04	3.3e+03	8.9e+07	
05 April	1.8e+05	1.3e+04	3.2e+03	1.4e+08		
06 April	1.7e+05	1.2e+04	3.0e+03	7.2e+07		
07 April	4.7e+05	1.3e+04	3.1e+03	3.0e+07		
08 April	4.8e+04	1.3e+04	3.1e+03	5.4e+04		
09 April	4.4e+04	1.3e+04	2.9e+03	8.1e+05		
10 April	8.6e+04	1.3e+04	3.1e+03	1.6e+05		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	04 April	6	2-2-2-2-3-0-1-1	6	1-1-3-2-3-1-0-0	7
05 April	5	1-1-1-1-3-1-1-1	6	0-1-1-1-4-1-1-1	5	2-1-1-1-2-1-2-1
06 April	7	2-1-1-3-3-1-1-1	13	2-2-1-5-4-3-0-0	7	2-1-2-3-2-2-1-1
07 April	10	2-1-0-1-2-2-4-4	5	0-0-1-2-1-1-2-3	17	2-1-1-1-1-2-5-5
08 April	6	3-2-2-1-1-1-1-1	5	3-3-2-0-0-1-1-0	9	5-3-2-1-0-1-1-1
09 April	3	0-0-0-1-2-2-2-0	1	0-0-0-0-1-2-0-0	3	1-1-1-1-1-1-1-0
10 April	6	0-2-3-2-2-1-1-2	7	1-1-4-3-0-0-0-2	5	1-2-3-2-2-1-0-3

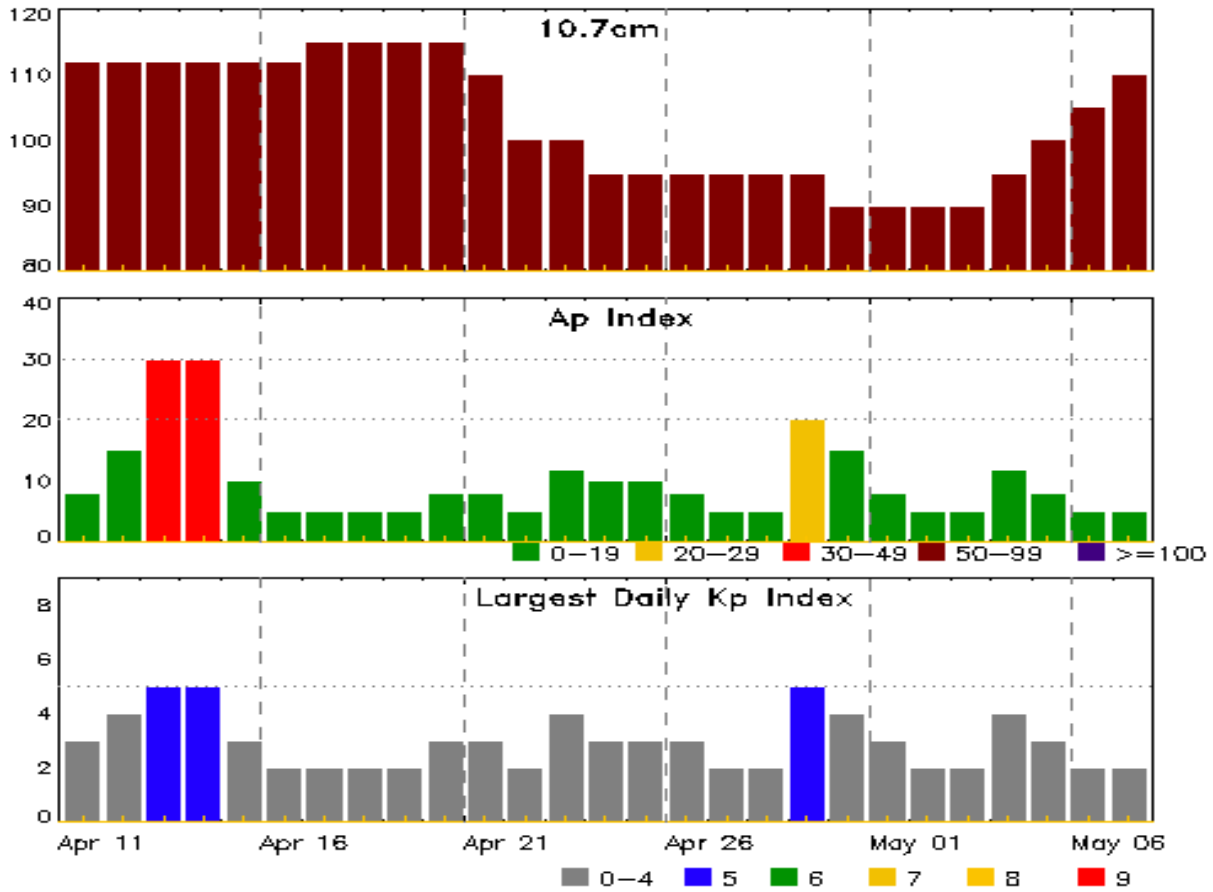


### *Alerts and Warnings Issued*

<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
04 Apr 1156	ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	04/1140
05 Apr 0832	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	04/1140
06 Apr 1226	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	04/1140
07 Apr 1505	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	04/1140
07 Apr 1818	WARNING: Geomagnetic K = 4	07/1820 - 08/0600
07 Apr 2010	ALERT: Geomagnetic K = 4	07/2009
07 Apr 2012	WARNING: Geomagnetic K = 5	07/2010 - 08/0300
07 Apr 2041	ALERT: Geomagnetic K = 5	07/2040
07 Apr 2201	ALERT: Geomagnetic K = 5	07/2200
07 Apr 2213	WARNING: Geomagnetic K = 6	07/2212 - 08/0600
08 Apr 0246	EXTENDED WARNING: Geomagnetic K = 5	07/2010 - 08/0900
08 Apr 0246	EXTENDED WARNING: Geomagnetic K = 4	07/1820 - 08/1300
08 Apr 0305	ALERT: Geomagnetic K = 5	08/0259



## Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
11 Apr	112	8	3	25 Apr	95	10	3
12	112	15	4	26	95	8	3
13	112	30	5	27	95	5	2
14	112	30	5	28	95	5	2
15	112	10	3	29	95	20	5
16	112	5	2	30	90	15	4
17	115	5	2	01 May	90	8	3
18	115	5	2	02	90	5	2
19	115	5	2	03	90	5	2
20	115	8	3	04	95	12	4
21	110	8	3	05	100	8	3
22	100	5	2	06	105	5	2
23	100	12	4	07	110	5	2
24	95	10	3				



## *Energetic Events*

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

**No Events Observed**

## *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
04 Apr	0940	0943	0948	B1.3			
04 Apr	1014	1014	1016		SF	S05W64	2526
04 Apr	1243	1248	1256	B2.0			
04 Apr	1925	1939	1949	B4.1			2528
05 Apr	0427	0430	0433	B1.5			
05 Apr	0731	0737	0742	B4.6			2528
05 Apr	B0745	U0746	0750		SF	N06W11	2528
05 Apr	1546	1549	1554	B2.5			2528
05 Apr	1745	1748	1751	B2.8			2528
06 Apr	0957	1011	1030	C1.1			
06 Apr	1639	1652	1713	C1.4			2529
07 Apr	0110	0117	0126	C1.4			2529
07 Apr	0550	0553	0555	C1.4			2529
07 Apr	0945	0948	0950	B8.6			2529
07 Apr	1106	1113	1121	C1.9			2529
07 Apr	1332	1337	1344	B7.7			2529
08 Apr	0501	0505	0509	B7.2			2529
08 Apr	1610	1614	1618	B6.1			2529
08 Apr	1631	1638	1645	C1.1			2529
09 Apr	0525	0530	0535	C1.5			2529
09 Apr	0846	0850	0854	B8.7	SF	N11E63	2529
09 Apr	1057	1057	1102		SF	N12E66	2529
09 Apr	1107	U1110	1112		SF	N11E65	2529
09 Apr	1115	1115	1121		SF	N11E65	2529
09 Apr	B1158	U1158	A1213		SF	N09E62	2529
09 Apr	1215	1342	1444	C2.8			2529
09 Apr	1326	1334	1337		SF	N08E62	2529
09 Apr	1341	1341	1347		SF	N10E64	2529
09 Apr	1609	1613	1616	C1.7	SF	N09E62	2529
09 Apr	1709	1711	1713		SF	N07E61	2529
09 Apr	1747	1755	1758	C1.6	SF	N07E60	2529



## *Flare List*

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/Brtns	Location Lat CMD	Rgn #
09 Apr	1840	1844	1846	C1.5	SF	N07E59	2529
09 Apr	2029	2034	2043	C1.5	SF	N07E60	2529
09 Apr	2059	2101	2104		SF	N07E60	2529
09 Apr	2201	2204	2207	C1.4			2529
09 Apr	2250	2255	2307	C1.8	SF	N07E57	2529
10 Apr	0031	0044	0047	C1.1			2529
10 Apr	0032	0034	0037		SF	N07E55	2529
10 Apr	0040	0045	0048		SF	N07E55	2529
10 Apr	0549	0934	1304	C1.5			2529
10 Apr	B1516	U1517	A1527		SF	N11E48	2529



## Region Summary

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
<b>Region 2526</b>																		
24 Mar	S05E72	176	120	2	Hsx	1	A											
25 Mar	S04E59	175	180	3	Hsx	1	A						1					
26 Mar	S04E45	176	190	3	Hsx	2	A						1					
27 Mar	S04E30	178	190	3	Hsx	2	A						1					
28 Mar	S04E18	177	190	3	Hsx	2	A						1					
29 Mar	S05E04	178	200	3	Cso	3	B											
30 Mar	S05W09	178	190	3	Hsx	2	A											
31 Mar	S05W22	178	200	3	Hsx	1	A											
01 Apr	S05W36	178	180	3	Hsx	1	A											
02 Apr	S05W48	177	190	2	Hsx	1	A											
03 Apr	S05W61	177	160	2	Hsx	1	A											
04 Apr	S03W76	179	150	2	Hsx	1	A						1					
05 Apr	S03W89	179	120	2	Hsx	1	A											
								0	0	0	5	0	0	0	0	0		

Crossed West Limb.  
Absolute heliographic longitude: 178

<b>Region 2527</b>																		
03 Apr	N14W16	132	0	1	Axx	2	A											
04 Apr	N14W30	133	plage															
05 Apr	N14W44	134	plage															
06 Apr	N14W58	134	plage															
07 Apr	N14W72	135	plage															
08 Apr	N14W86	136	plage															
								0	0	0	0	0	0	0	0	0	0	

Crossed West Limb.  
Absolute heliographic longitude: 132

<b>Region 2528</b>																		
03 Apr	N06E06	110	10	5	Bxo	5	B											
04 Apr	N07W09	112	10	5	Bxo	2	B											
05 Apr	N07W23	113	30	5	Cro	6	BG						1					
06 Apr	N07W37	113	20	5	Dro	3	B											
07 Apr	N07W51	114	40	5	Cao	5	B											
08 Apr	N07W64	114	10	5	Bxo	2	B											
09 Apr	N07W79	116	10	1	Axx	1	A											
								0	0	0	1	0	0	0	0	0		

Crossed West Limb.  
Absolute heliographic longitude: 110





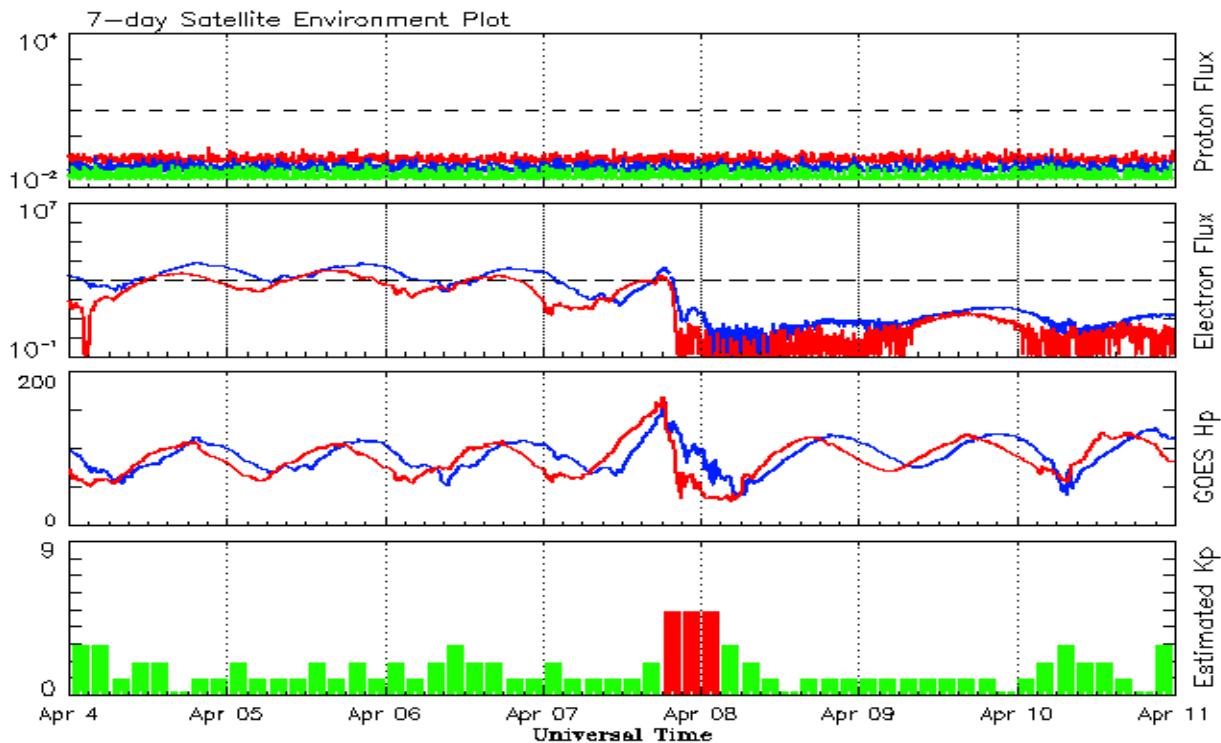


**Recent Solar Indices (preliminary)  
Observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
<b>2014</b>									
April	130.5	67.5	0.65	124.8	69.8	144.3	143.5	9	7.5
May	116.8	67.5	0.64	122.3	69.0	130.0	144.7	7	7.9
June	107.7	61.7	0.66	121.4	68.5	122.2	145.5	7	8.4
July	113.6	60.1	0.64	120.4	67.6	137.3	145.2	5	8.8
August	106.2	64.1	0.70	115.1	65.0	124.7	142.8	9	8.9
September	127.4	78.0	0.69	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	55.3	158.7	137.0	12	10.5
<b>2015</b>									
January	101.2	55.8	0.66	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	47.3	129.2	127.3	12	12.4
May	83.0	53.3	0.71	77.5	45.7	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	43.3	123.2	119.5	14	13.0
July	68.4	39.5	0.58	68.2	41.0	107.0	116.0	10	13.1
August	61.6	38.6	0.63	65.5	39.8	106.2	113.3	16	13.1
September	72.5	47.2	0.65	64.0	39.6	102.1	110.8	16	12.8
October	59.5	38.2	0.62			104.1		15	
November	61.8	37.3	0.61			109.6		13	
December	54.1	34.8	0.64			112.8		15	
<b>2016</b>									
January	50.4	34.0	0.67			103.5		10	
February	56.0	34.3	0.61			103.5		10	
March	40.9	32.9	0.80			91.6		11	

**Note:** Values are final except for the most recent 6 months which are considered preliminary.  
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 04 April 2016*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

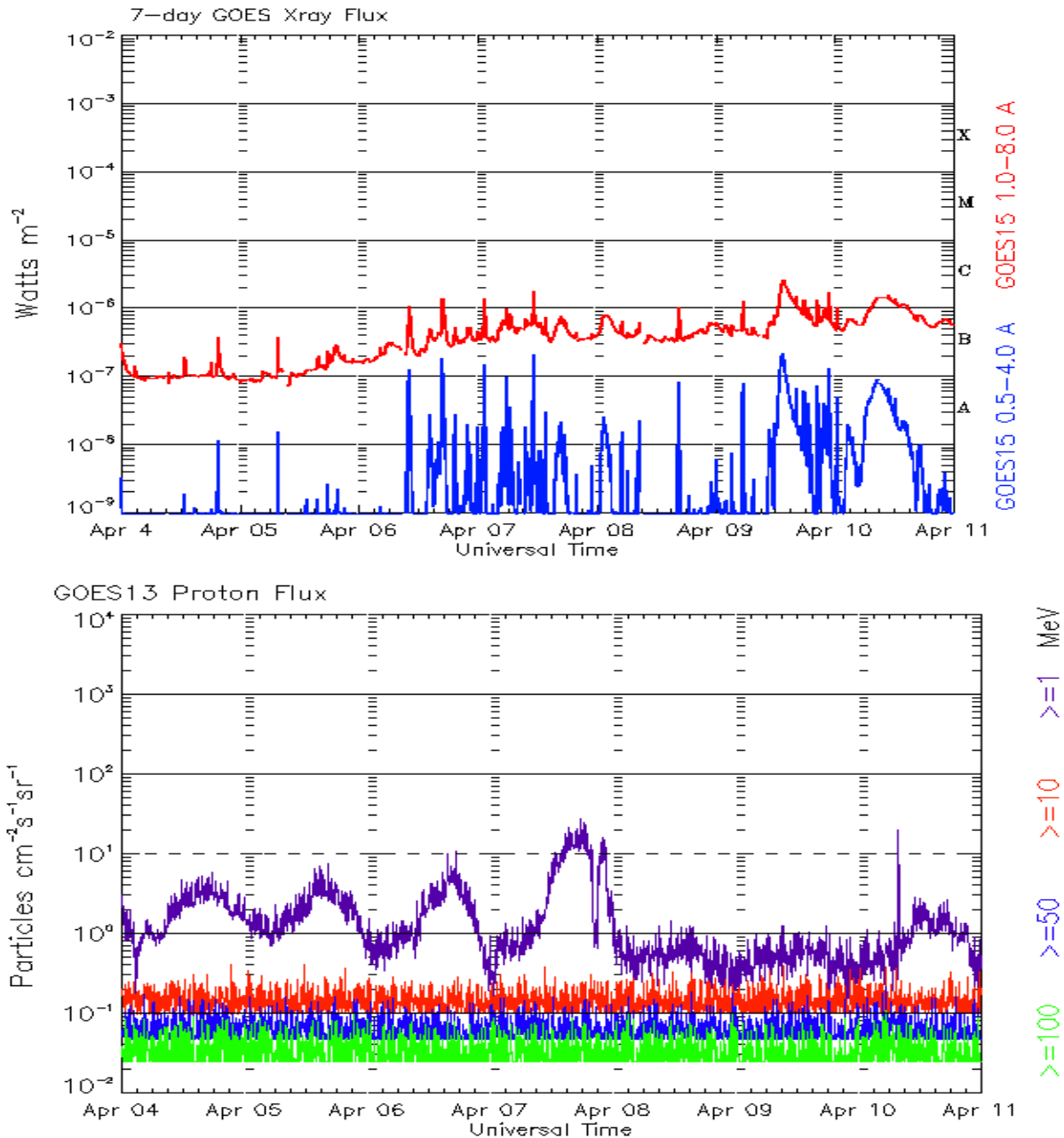
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

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.

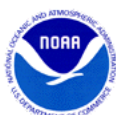




*Weekly GOES Satellite X-ray and Proton Plots  
Week Beginning 04 April 2016*

The x-ray plots contains five-minute averages x-ray flux (Watt/m<sup>2</sup>) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged integral flux units (pfu = protons/cm<sup>2</sup> -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.



## ***Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)***

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**Notice:** The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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