

**Space Weather Highlights**  
**06 February - 12 February 2017**

**SWPC PRF 2163**  
**13 February 2017**

Solar activity reached low levels on 09 Feb due to C-class flare activity from Region 2635 (N14, L=304, class/area=Dai/110 on 10 Feb). Solar activity was at very low levels throughout the remainder of the period and no Earth-directed coronal mass ejections (CMEs) were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels each day of this period.

Geomagnetic field activity was at quiet to active levels on 06 Feb, quiet to unsettled levels on 07, 10-11 Feb, and quiet throughout the remainder of the period.

**Space Weather Outlook**  
**13 February - 11 March 2017**

Solar activity is expected to be at very low levels with a slight chance for isolated C-class flare activity throughout the period.

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 13, 16-18, 22-26, 28 Feb, and 01-11 Mar. Normal to moderate flux levels are expected for the remainder of the period.

Geomagnetic field activity is expected to reach G2 (Moderate) geomagnetic storm levels on 28 Feb and G1 (Minor) storm levels on 27 Feb, 01-02 Mar due to recurrent coronal hole high speed stream influence. Active geomagnetic field activity is expected on 15, 23 Feb, and 03-04 Mar. Quiet and quiet to unsettled geomagnetic activity is expected for the remainder of the period under a nominal solar wind regime.



### *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	4
06 February	73	15	10	A6.7	0	0	0	0	0	0	0	0
07 February	72	11	10	A6.3	0	0	0	0	0	0	0	0
08 February	73	0	0	A5.8	0	0	0	2	0	0	0	0
09 February	73	15	70	A6.4	3	0	0	1	0	0	0	0
10 February	74	18	110	A5.9	0	0	0	0	0	0	0	0
11 February	76	18	110	A6.2	0	0	0	0	0	0	0	0
12 February	76	18	90	A6.4	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	>0.6 MeV	>2MeV	>4 MeV
	06 February	1.1e+06	1.5e+04	3.7e+03	5.3e+08	
07 February	8.9e+05	1.5e+04	3.8e+03	5.2e+08		
08 February	1.8e+06	1.5e+04	3.7e+03	7.1e+08		
09 February	1.8e+06	1.5e+04	3.7e+03	4.4e+08		
10 February	1.4e+06	1.5e+04	3.4e+03	2.1e+08		
11 February	1.0e+06	1.5e+04	3.6e+03	1.0e+08		
12 February	1.3e+06	1.6e+04	3.8e+03	1.6e+08		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	06 February	10	3-3-1-2-2-2-2-3	16	3-3-1-2-5-4-2-2	13
07 February	5	2-2-1-1-2-1-2-1	8	2-2-1-3-3-2-2-1	7	3-2-1-1-2-2-2-2
08 February	3	1-0-0-1-2-2-1-1	7	0-0-1-3-2-3-2-2	5	1-0-1-1-2-2-1-2
09 February	5	2-1-1-1-2-1-2-2	6	1-0-1-3-2-2-2-1	7	2-1-1-2-1-2-2-2
10 February	5	2-0-1-2-2-2-1-2	11	1-0-1-4-4-4-0-1	8	2-1-2-2-2-3-2-3
11 February	3	2-1-0-1-1-1-1-0	2	1-1-0-2-0-0-0-1	5	3-2-1-1-0-0-1-1
12 February	2	0-0-1-0-1-1-1-0	1	0-0-0-1-0-0-1-0	3	1-0-1-0-1-1-1-1



### *Alerts and Warnings Issued*

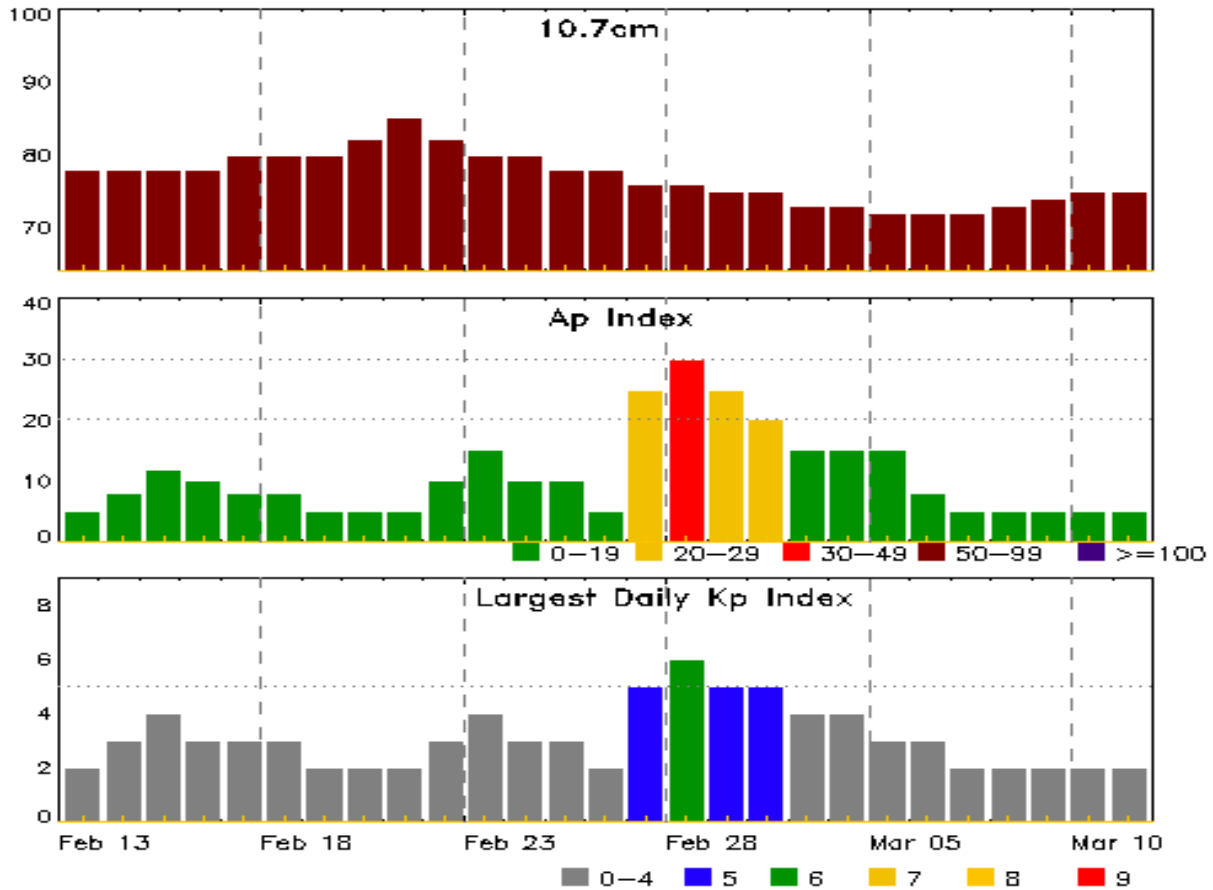
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<b>Date &amp; Time of Issue UTC</b>	<b>Type of Alert or Warning</b>	<b>Date &amp; Time of Event UTC</b>
06 Feb 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
06 Feb 2251	WARNING: Geomagnetic K = 4	06/2252 - 07/0600
06 Feb 2306	ALERT: Geomagnetic K = 4	06/2306
07 Feb 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
08 Feb 0500	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
09 Feb 0555	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
10 Feb 0821	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
11 Feb 1020	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240
12 Feb 0941	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	01/1240

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## 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
13 Feb	78	5	2	27 Feb	76	25	5
14	78	8	3	28	76	30	6
15	78	12	4	01 Mar	75	25	5
16	78	10	3	02	75	20	5
17	80	8	3	03	73	15	4
18	80	8	3	04	73	15	4
19	80	5	2	05	72	15	3
20	82	5	2	06	72	8	3
21	85	5	2	07	72	5	2
22	82	10	3	08	73	5	2
23	80	15	4	09	74	5	2
24	80	10	3	10	75	5	2
25	78	10	3	11	75	5	2
26	78	5	2				



### *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	Radio Flux 2695	Intensity II

**No Events Observed**

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD	Rgn #	
06 Feb	1616	1622	1631	B1.5				2634
08 Feb	2308	2311	2318	B1.1	SF	N12E28		2635
08 Feb	2326	2335	2336		SF	N12E28		2635
09 Feb	0042	0050	0055	B2.7				2635
09 Feb	0135	0140	0142	B3.1				2635
09 Feb	0145	0151	0156	C1.1				2635
09 Feb	0256	0309	0316	B6.0				2635
09 Feb	0320	0326	0329	C1.3				2635
09 Feb	0531	0542	0549	B6.1				2635
09 Feb	0605	0612	0615	B3.8				2635
09 Feb	0631	0635	0637	B3.3				2635
09 Feb	0655	0702	0704	C1.1	SF	N06E23		2635
09 Feb	0739	0748	0750	B3.0				2635
09 Feb	0932	0937	0939	B3.0				2635
09 Feb	1032	1035	1037	B1.5				2635
09 Feb	1056	1059	1103	B1.1				2635
09 Feb	1154	1204	1231	B1.7				2635
12 Feb	0430	0434	0438	B1.5				2635



## Region Summary

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

### Region 2630

30 Jan	N16E54	35	10	1	Axx	1	A										
31 Jan	N16E39	36	plage														
01 Feb	N16E25	37	plage														
02 Feb	N16E11	38	plage														
03 Feb	N16W03	39	plage														
04 Feb	N16W17	40	plage														
05 Feb	N16W31	41	plage														
06 Feb	N16W45	41	plage														
07 Feb	N16W59	42	plage														
08 Feb	N16W73	43	plage														
09 Feb	N16W87	44	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 39

### Region 2632

31 Jan	N14W08	83	10	4	Bxo	6	B										
01 Feb	N14W22	84	50	5	Dao	7	B										
02 Feb	N14W36	85	60	7	Dao	6	B										
03 Feb	N16W50	86	30	8	Cao	6	B										
04 Feb	N16W64	87	10	1	Axx	1	A										
05 Feb	N14W76	86	10	1	Axx	1	A										
06 Feb	N14W90	86	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 83

### Region 2634

05 Feb	N02E70	300	10		Axx	1	A										
06 Feb	N05E56	300	10		Bxo	5	B										
07 Feb	N03E44	299	10		Axx	1	A										
08 Feb	N03E29	301	plage														
09 Feb	N03E16	301	plage														
10 Feb	N03E02	302	plage														
11 Feb	N03W12	303	plage														
12 Feb	N03W26	303	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 302





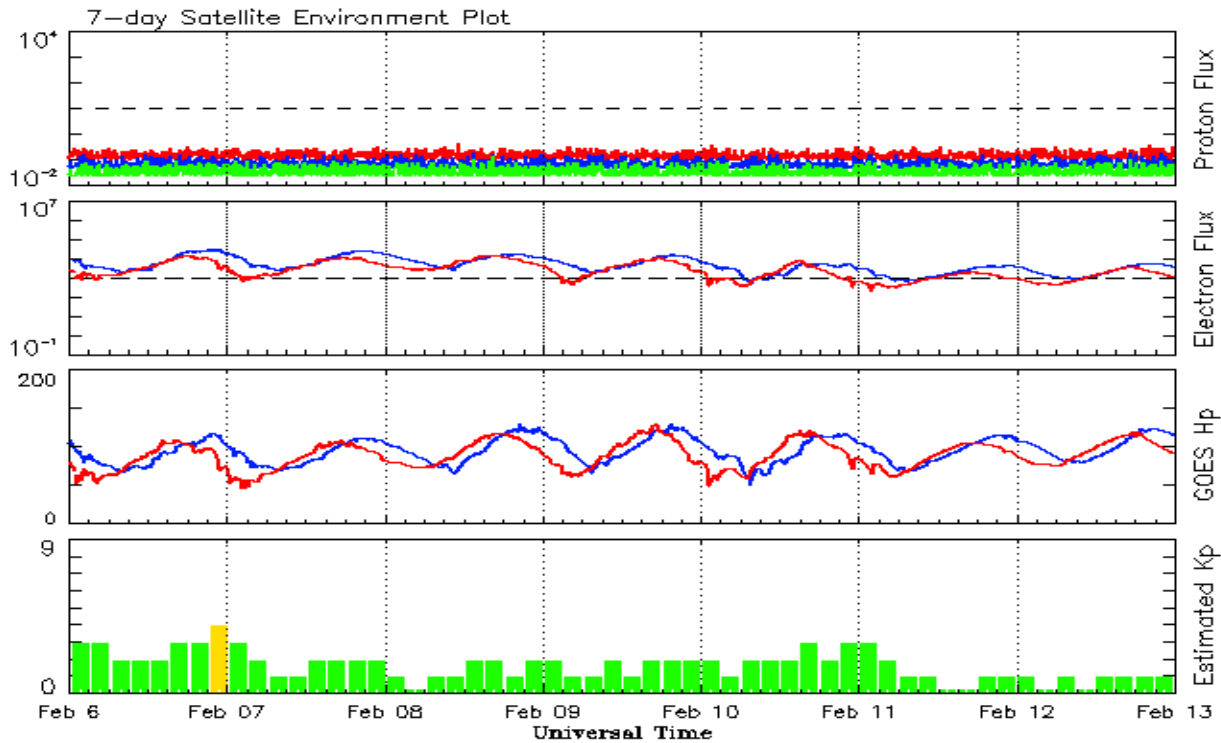
**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

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>2015</b>									
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	39.5	102.1	110.8	16	12.8
October	59.5	38.2	0.62	61.8	38.6	104.1	107.9	15	12.5
November	61.8	37.3	0.61	59.0	36.7	109.6	105.3	13	12.5
December	54.1	34.8	0.64	55.1	34.7	112.8	102.5	15	12.5
<b>2016</b>									
January	50.4	34.2	0.67	51.4	32.6	103.5	99.9	10	12.3
February	56.0	33.8	0.61	49.6	31.5	103.5	98.1	10	12.0
March	40.9	32.5	0.80	47.7	30.2	91.6	96.6	11	11.8
April	39.2	22.7	0.58	45.0	28.7	93.4	95.3	10	11.8
May	48.9	30.9	0.64	42.1	26.9	93.1	93.2	12	11.7
June	19.3	12.3	0.65	39.0	24.9	81.9	90.4	9	11.4
July	36.8	19.4	0.53	36.5	23.2	85.9	87.7	10	11.2
August	50.4	30.1	0.60			85.0		10	
September	37.4	26.8	0.72			87.8		16	
October	30.0	20.2	0.67			86.1		16	
November	22.4	12.8	0.57			78.7		10	
December	17.6	11.3	0.64			75.1		10	
<b>2017</b>									
January	28.1	15.5	0.55			77.4		10	

**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 06 February 2017*

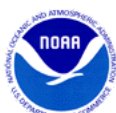
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

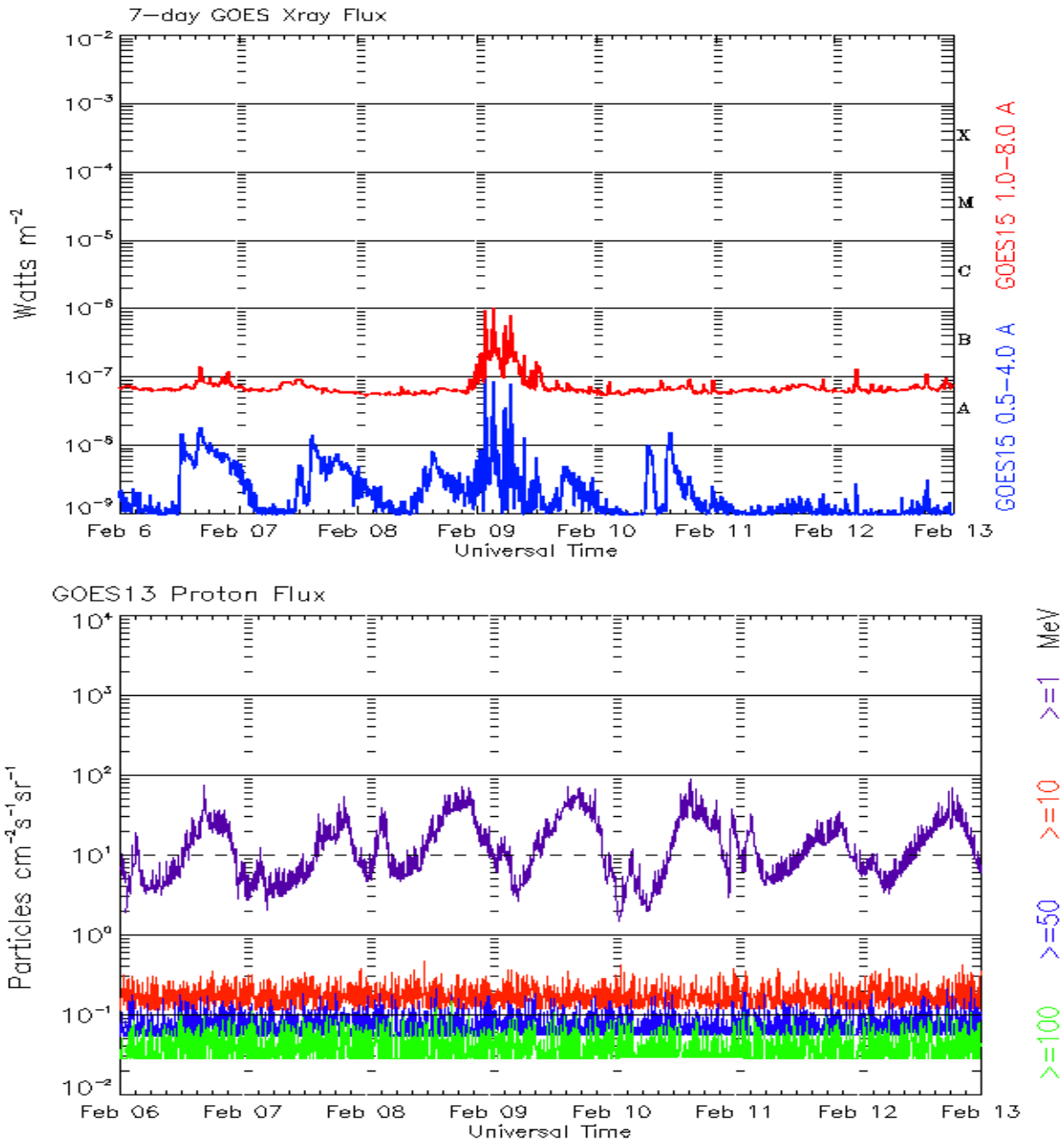
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 06 February 2017*

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 intergral 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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NOAA / National Weather Service  
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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

The Weekly has been published continuously since 1951 and is available online since 1997.

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[http://spaceweather.gov/weekly/Usr\\_guide.pdf](http://spaceweather.gov/weekly/Usr_guide.pdf) -- User Guide

