

Space Weather Highlights
09 October - 15 October 2017

SWPC PRF 2198
16 October 2017

Solar activity was at very low levels and spotless with the exception of the emergence of new Region 2684 (N11, L=312, class/area Bxo/010 on 15 Oct) late in the period. No Earth-directed coronal mass ejections were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 09-11 Oct, high levels on 12-14 Oct, and very high levels on 15 Oct. The largest flux of the period was 59,298 pfu observed at 15/1645 UTC.

Geomagnetic field activity ranged from quiet to G2 (Moderate) storm levels. The period began with solar wind speeds between 300-400 km/s and total field ranging from 1-5 nT on 09-10 Oct. The geomagnetic field was at quiet levels on 09 Oct and quiet to unsettled levels on 10 Oct. By late on 10 Oct, total field and solar wind speed began to increase as a polar connected, positive polarity, coronal hole high speed stream (CH HSS) became geoeffective. Total field increased to 12 nT at 11/1115 UTC and solar wind speed gradually increased to a maximum of 737 km/s at 14/0550 UTC. Solar wind speed slowly decreased thereafter to near 550 km/s by the end of the period. The geomagnetic field responded with unsettled to G1 (Minor) geomagnetic storm levels on 11-12 Oct and 14-15 Oct. Quiet to G2 (Moderate) storm levels were observed on 13 Oct.

Space Weather Outlook
16 October - 11 November 2017

Solar activity is expected to be at very low levels. A chance for C-flares is likely on 19 Oct-03 Nov with the return of old Regions 2682 (S10, L=126) and 2683 (N13, L=111).

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high to very high levels on 16-18 Oct and again on 27 Oct and 11 Nov. High levels are expected on 19-21 Oct, 25-26 Oct, 28 Oct-01 Nov and on 08-10 Nov due to recurrent CH HSS influences.

Geomagnetic field activity is expected to be at unsettled to active levels on 16-22 Oct, 24-29 Oct, 01-02 Nov, and 07-11 Nov. G1 (Minor) geomagnetic storm levels are likely on 24-25 Oct and 07-11 Nov and G2 (Moderate) levels are likely on 25 Oct and 10 Nov due to recurrent CH HSS effects.



Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
09 October	72	0	0	A7.7	0	0	0	0	0	0	0	0
10 October	71	0	0	A2.1	0	0	0	0	0	0	0	0
11 October	70	0	0	A1.1	0	0	0	0	0	0	0	0
12 October	70	0	0	A1.4	0	0	0	0	0	0	0	0
13 October	70	0	0	A0.0	0	0	0	0	0	0	0	0
14 October	69	0	0	A1.8	0	0	0	0	0	0	0	0
15 October	70	12	10	A2.5	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	>0.6 MeV	>2MeV	>4 MeV
	09 October	7.1e+05	1.4e+04	3.4e+03	2.0e+07	
10 October	4.6e+08	1.5e+04	3.5e+03	2.4e+07		
11 October	7.7e+08	1.8e+04	3.3e+03	1.7e+06		
12 October	1.8e+07	1.5e+04	3.3e+03	5.4e+07		
13 October	4.2e+07	1.5e+04	3.3e+03	1.1e+08		
14 October	3.5e+07	1.5e+04	3.2e+03	7.6e+08		
15 October	5.9e+07	1.4e+04	3.3e+03	1.1e+09		

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	09 October	2	2-0-0-1-1-1-1-0	0	0-0-0-0-0-0-0-0	3
10 October	13	0-1-0-1-1-1-6-3	1	0-0-0-2-1-0-0-0	4	0-0-0-1-1-0-1-3
11 October	21	3-4-4-4-4-3-3-3	58	2-5-6-7-6-6-3-3	30	3-4-5-4-4-5-4-4
12 October	20	4-3-3-4-4-3-2-4	65	4-4-7-6-7-6-2-3	29	5-4-4-4-5-4-3-4
13 October	26	3-4-2-4-4-4-4-5	52	3-3-2-6-7-6-5-4	42	3-5-2-4-6-5-6-5
14 October	26	5-4-4-5-4-2-2-3	49	4-5-6-7-5-4-3-2	31	5-4-5-5-4-4-3-3
15 October	21	4-5-3-4-4-3-2-1	49	3-5-5-7-6-5-2-2	32	4-5-3-4-5-4-3-1



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
09 Oct 1918	WATCH: Geomagnetic Storm Category G1 predicted	
10 Oct 1947	WATCH: Geomagnetic Storm Category G1 predicted	
11 Oct 0151	WARNING: Geomagnetic K = 4	11/0150 - 12/2359
11 Oct 0553	ALERT: Geomagnetic K = 4	11/0551
11 Oct 0728	WARNING: Geomagnetic K = 5	11/0730 - 1500
11 Oct 0851	ALERT: Geomagnetic K = 5	11/0851
11 Oct 1419	EXTENDED WARNING: Geomagnetic K = 5	11/0730 - 2359
11 Oct 1751	ALERT: Geomagnetic K = 5	11/1748
11 Oct 2357	EXTENDED WARNING: Geomagnetic K = 5	11/0730 - 12/1200
12 Oct 0041	ALERT: Geomagnetic K = 5	12/0040
12 Oct 1044	EXTENDED WARNING: Geomagnetic K = 5	11/0730 - 12/1800
12 Oct 1405	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1350
12 Oct 1500	ALERT: Geomagnetic K = 5	12/1459
12 Oct 1754	EXTENDED WARNING: Geomagnetic K = 5	11/0730 - 13/0300
12 Oct 1817	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 13/1200
13 Oct 0422	WARNING: Geomagnetic K = 5	13/0420 - 1200
13 Oct 0601	ALERT: Geomagnetic K = 5	13/0559
13 Oct 0831	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1350
13 Oct 1108	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 13/1800
13 Oct 1109	EXTENDED WARNING: Geomagnetic K = 5	13/0420 - 1500
13 Oct 1437	EXTENDED WARNING: Geomagnetic K = 5	13/0420 - 2359
13 Oct 1437	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 13/0600
13 Oct 1441	ALERT: Geomagnetic K = 5	13/1441
13 Oct 1446	WARNING: Geomagnetic K = 6	13/1446 - 2100
13 Oct 1500	ALERT: Geomagnetic K = 6	13/1459
13 Oct 1513	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 14/0600
13 Oct 1559	ALERT: Geomagnetic K = 5	13/1559
13 Oct 1722	WATCH: Geomagnetic Storm Category G1 predicted	

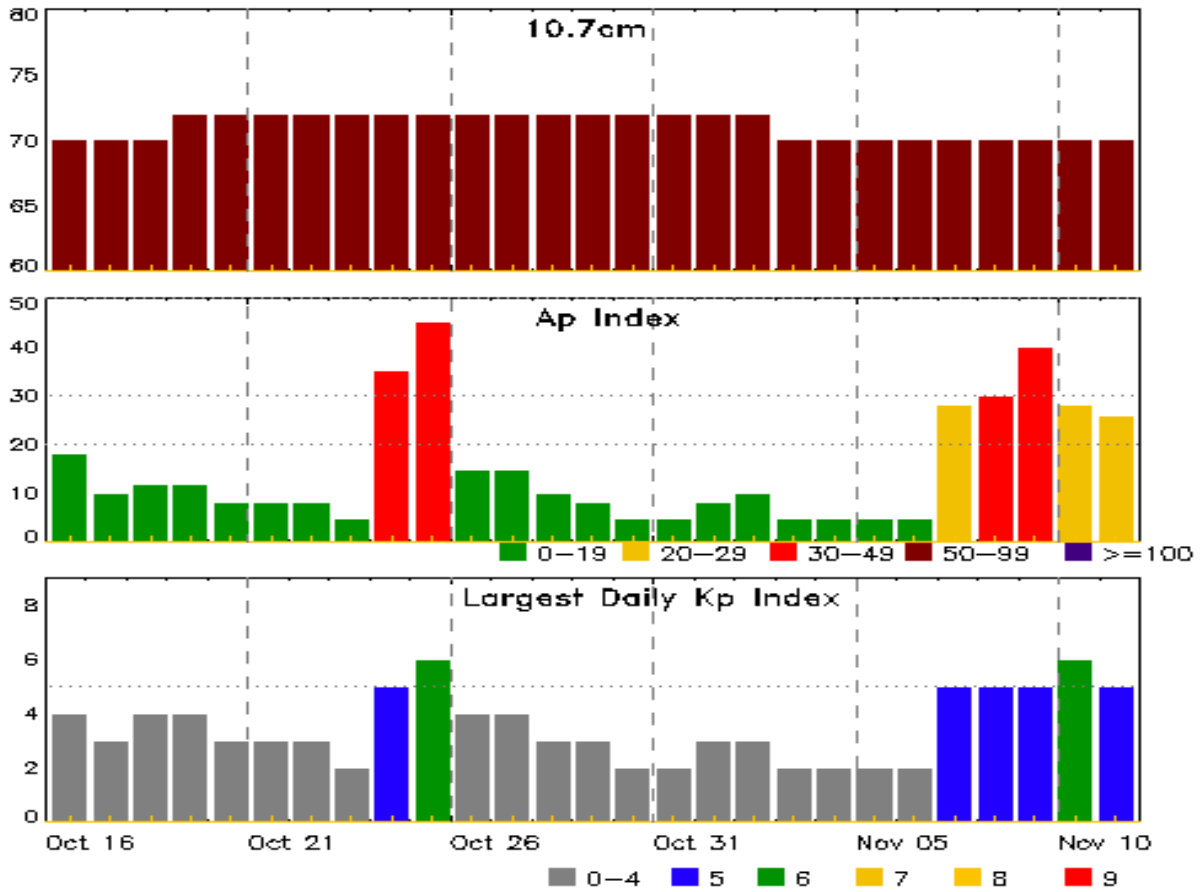


Alerts and Warnings Issued

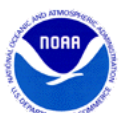
Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
13 Oct 1902	ALERT: Geomagnetic K = 5	13/1902
13 Oct 1944	EXTENDED WARNING: Geomagnetic K = 5	13/0420 - 14/0900
13 Oct 1944	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 14/1500
13 Oct 1944	ALERT: Geomagnetic K = 6	13/1944
13 Oct 1944	EXTENDED WARNING: Geomagnetic K = 6	13/1446 - 14/0300
13 Oct 2258	ALERT: Geomagnetic K = 5	13/2257
14 Oct 0131	ALERT: Geomagnetic K = 5	14/0130
14 Oct 0255	EXTENDED WARNING: Geomagnetic K = 5	13/0420 - 14/1500
14 Oct 0255	EXTENDED WARNING: Geomagnetic K = 6	13/1446 - 14/0900
14 Oct 0502	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1350
14 Oct 0901	ALERT: Geomagnetic K = 5	14/0859
14 Oct 1012	ALERT: Geomagnetic K = 5	14/1008
14 Oct 1432	EXTENDED WARNING: Geomagnetic K = 5	13/0420 - 14/2359
14 Oct 1432	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 15/0600
15 Oct 0431	WARNING: Geomagnetic K = 5	15/0430 - 0900
15 Oct 0439	ALERT: Geomagnetic K = 5	15/0439
15 Oct 0506	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	12/1350
15 Oct 0513	WARNING: Geomagnetic K = 6	15/0513 - 0900
15 Oct 0525	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 15/2100
15 Oct 1411	EXTENDED WARNING: Geomagnetic K = 4	11/0150 - 16/0300
15 Oct 1411	WARNING: Geomagnetic K = 5	15/1410 - 2100
15 Oct 1501	ALERT: Geomagnetic K = 5	15/1459



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
16 Oct	70	18	4	30 Oct	72	5	2
17	70	10	3	31	72	5	2
18	70	12	4	01 Nov	72	8	3
19	72	12	4	02	72	10	3
20	72	8	3	03	70	5	2
21	72	8	3	04	70	5	2
22	72	8	3	05	70	5	2
23	72	5	2	06	70	5	2
24	72	35	5	07	70	28	5
25	72	45	6	08	70	30	5
26	72	15	4	09	70	40	5
27	72	15	4	10	70	28	6
28	72	10	3	11	70	26	5
29	72	8	3				



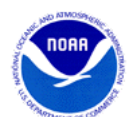
Energetic Events

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

No Events Observed

Flare List

Date	Time			X-ray Class	Optical			Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD		
09 Oct	0321	0324	0331	B1.4				2683



Region Summary

Date	Location		Sunspot Characteristics				Flares																
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
Region 2683																							
25 Sep	N11E76	109	260	3	Hkx	2	A																
26 Sep	N12E60	111	160	5	Dao	2	B	1				1											
27 Sep	N13E46	112	270	4	Hkx	2	A	1					1										
28 Sep	N14E26	119	280	5	Hkx	2	A																
29 Sep	N14E21	111	270	4	Hkx	2	A																
30 Sep	N13E08	111	270	4	Hkx	2	A																
01 Oct	N13W05	111	270	4	Hkx	2	A																
02 Oct	N13W19	111	290	3	Hkx	4	A																
03 Oct	N13W32	111	330	4	Cko	4	B																
04 Oct	N13W45	111	300	6	Cko	6	B																
05 Oct	N13W58	111	280	5	Cko	5	B	1															
06 Oct	N13W71	111	270	5	Hkx	1	A					2											
07 Oct	N13W84	111	220	4	Hax	1	A																
08 Oct	N13W98	111	plage																				
								3	0	0		3	1	0	0	0	0						

Crossed West Limb.

Absolute heliographic longitude: 111

Region 2684

15 Oct	N11W32	312	10	2	Bxo	2	B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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Still on Disk.

Absolute heliographic longitude: 312

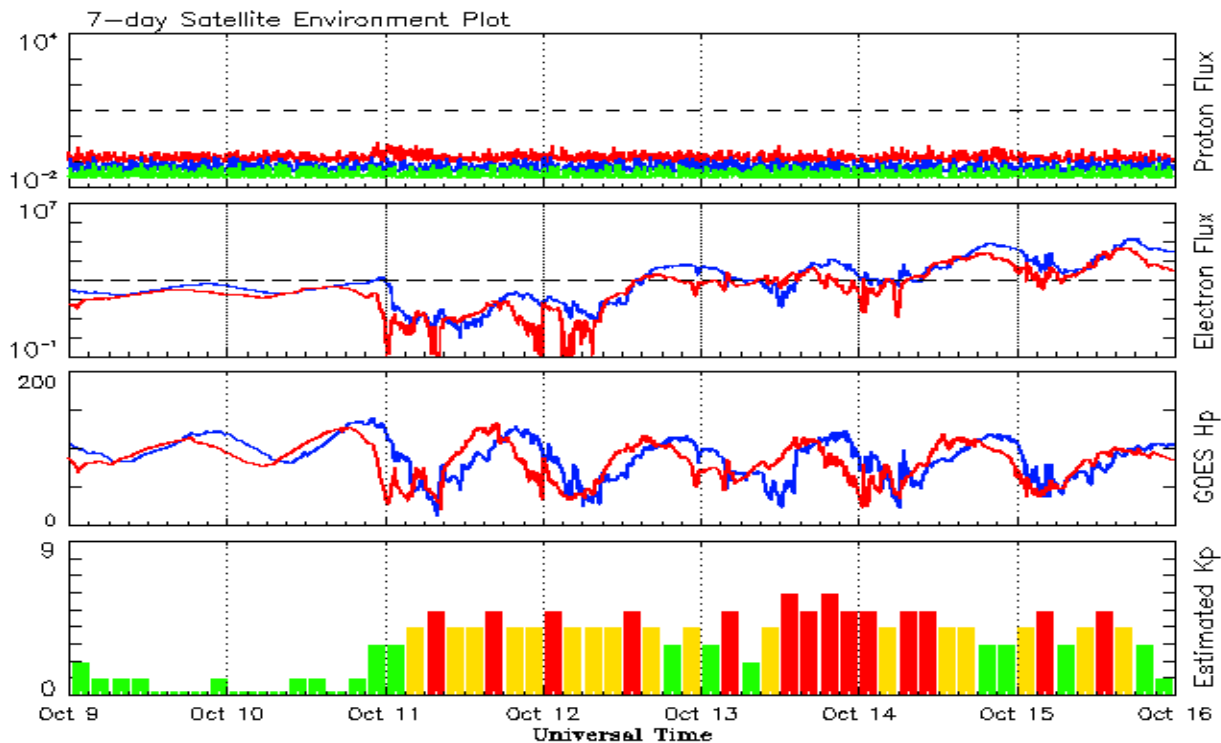


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2015									
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
2016									
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	23.1	85.9	87.7	10	11.2
August	50.4	30.1	0.60	34.2	21.6	85.0	85.5	10	11.2
September	37.4	26.8	0.72	32.1	19.9	87.8	83.7	16	11.3
October	30.0	20.0	0.67	31.1	18.9	86.1	82.5	16	11.6
November	22.4	12.8	0.57	29.4	17.9	78.7	81.1	10	11.6
December	17.6	11.1	0.64	28.1	17.1	75.1	80.0	10	11.4
2017									
January	28.1	15.7	0.55	27.3	16.7	77.4	79.4	10	11.3
February	22.0	15.8	0.71	25.5	15.9	76.9	78.7	10	11.3
March	25.4	10.6	0.42	24.6	15.5	74.6	78.6	15	11.5
April	30.4	19.4	0.64			80.9		13	
May	18.1	11.3	0.62			73.5		9	
June	18.0	11.5	0.64			74.8		7	
July	18.8	11.0	0.59			77.7		9	
August	25.0	19.9	0.80			77.9		12	
September	42.2	26.2	0.62			92.0		19	

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 09 October 2017*

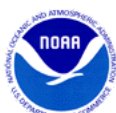
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

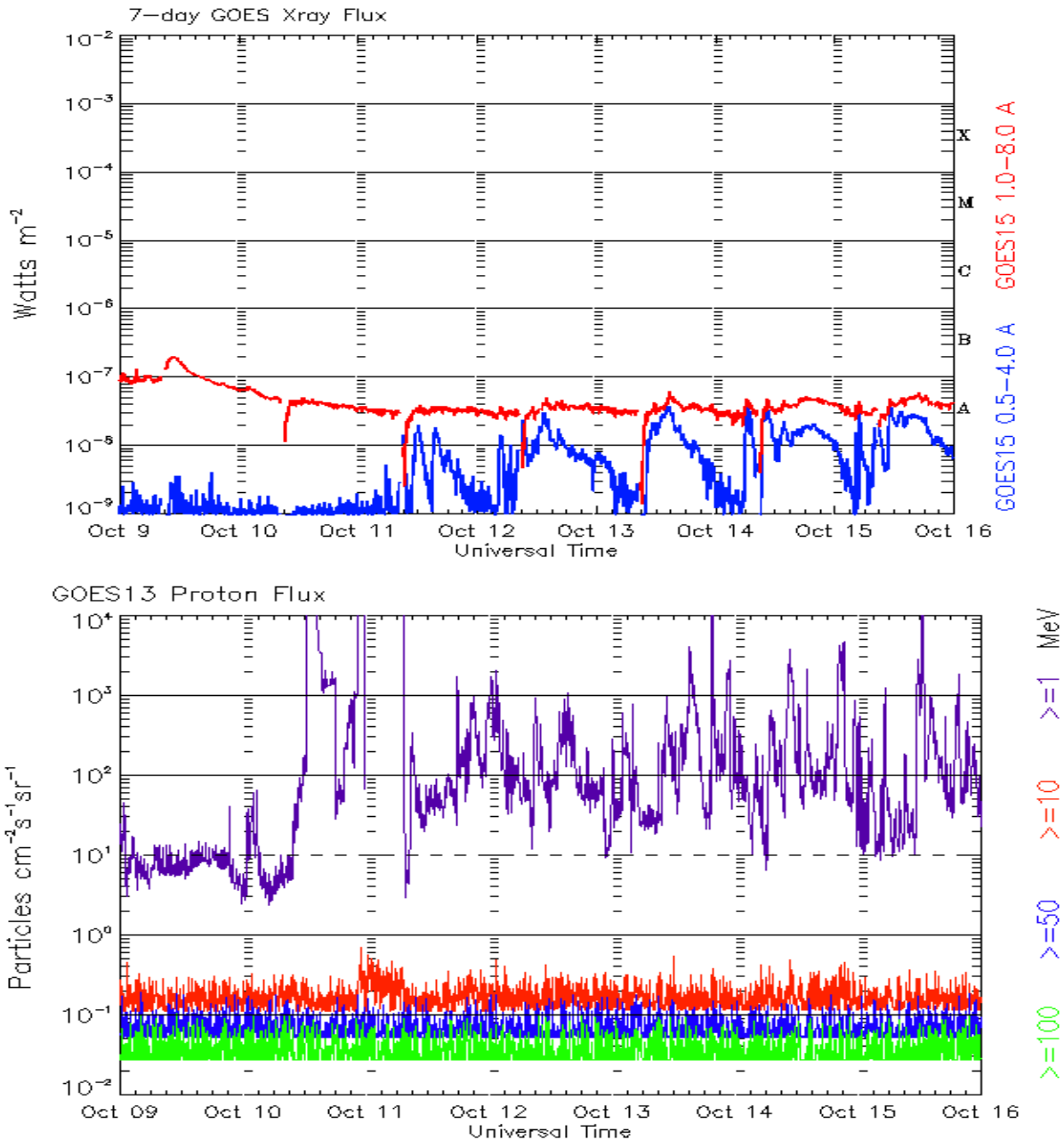
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 09 October 2017*

The x-ray plots contains five-minute averages x-ray flux (Watt/m²) 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/cm² -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

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

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<http://spaceweather.gov/SolarCycle/> -- Solar Cycle Progression web site

<http://spaceweather.gov/contacts.html> -- Contact and Copyright information

http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide

