

Space Weather Highlights
20 February - 26 February 2017

SWPC PRF 2165
27 February 2017

Solar activity was at very low levels on 20-21 and 25-26 Feb with low levels observed on 22-24 Feb. Region 2638 (N19, L=111, class/area Dso/150 on 22 Feb) produced three C-class flares, one each on 22-24 Feb. The largest of these was a C4/1f flare observed on 22/1327 UTC. Several weak CMEs were observed during the period, but none of them had an Earth-directed component.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at moderate levels on 20, 22-24 and 26 Feb. High levels were observed on 21 and 25 Feb.

Geomagnetic field activity was at predominately quiet to active levels with an isolated minor storm (G1-Minor) interval early on 24 Feb. Quiet to unsettled levels were observed on 20-21 and 25-26 Feb under a nominal solar wind regime. Quiet to isolated G1 levels were observed on 22-24 Feb under the influence of a positive polarity CH HSS. Solar wind speeds reached a peak of 671 km/s at 24/0516 UTC. Total field (Bt) reached a peak of near 12 nT late on 23 Feb while the Bz component reached a maximum southward extent of -10 nT, again late on 23 Feb. Phi angle was in a predominately positive solar sector throughout the summary period.

Space Weather Outlook
27 February - 25 March 2017

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

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 27 Feb, 01-13, 19-20 and 24-25 Mar. Normal to moderate levels are expected on 28 Feb, 14-18 and 21-23 Mar.

Geomagnetic field activity is likely to be reach G1 (Minor) geomagnetic storm levels on 01-02 and 16 Mar due to recurrent CH HSS influence. Unsettled to active geomagnetic field activity is expected on 28 Feb, 03-04, 15, 17-19 and 21-24 Mar due to CH HSS influence. Mostly quiet conditions are 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 ⁻⁶ hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
20 February	81	25	90	B1.2	0	0	0	1	0	0	0	0
21 February	83	19	140	B1.3	0	0	0	3	0	0	0	0
22 February	83	17	150	B1.1	1	0	0	1	1	0	0	0
23 February	83	18	150	B1.1	1	0	0	4	0	0	0	0
24 February	82	27	140	A9.0	1	0	0	2	0	0	0	0
25 February	80	25	120	A8.4	0	0	0	0	0	0	0	0
26 February	79	35	120	A6.7	0	0	0	1	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
	20 February	8.7e+05	1.5e+04	3.7e+03	3.4e+03	3.4e+07
21 February	1.1e+06	1.5e+04	3.4e+03	3.4e+03	3.8e+07	
22 February	6.9e+05	1.5e+04	3.6e+03	3.6e+03	9.4e+06	
23 February	1.0e+06	1.5e+04	3.6e+03	3.6e+03	1.1e+07	
24 February	1.5e+06	1.4e+04	3.1e+03	3.1e+03	1.5e+07	
25 February	9.2e+05	1.5e+04	3.5e+03	3.5e+03	4.8e+07	
26 February	9.8e+05	1.4e+04	3.7e+03	3.7e+03	4.8e+07	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 February	8	1-3-2-2-2-2-2-2	12	1-2-4-3-3-3-2-1	10
21 February	4	1-2-1-0-1-2-0-2	1	0-0-1-0-0-0-0-1	4	2-2-1-0-0-1-0-2
22 February	8	3-3-3-2-1-1-1-1	20	2-4-3-6-3-2-2-1	10	4-3-3-2-1-1-2-1
23 February	8	2-2-2-2-2-3-2-2	11	1-2-2-2-4-4-2-1	11	2-2-2-2-2-3-2-3
24 February	15	4-3-3-4-3-2-1-2	24	3-3-3-6-5-2-2-2	20	5-4-3-4-4-3-2-3
25 February	6	2-3-2-1-1-1-1-1	4	2-2-2-2-1-0-0-0	7	3-3-2-2-1-0-1-2
26 February	0	0-1-0-0-0-0-0-0	0	0-0-0-0-1-0-0-0	3	1-1-0-0-1-0-0-0

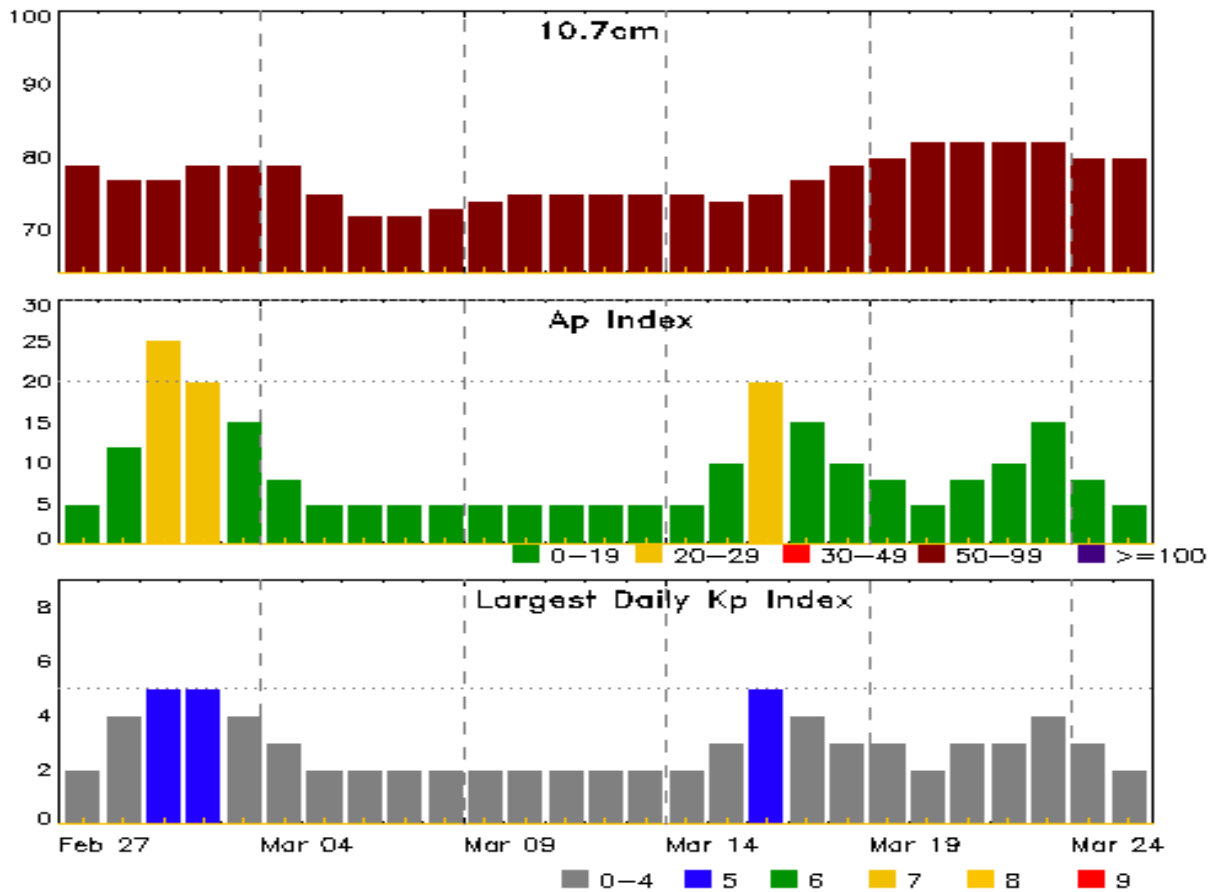


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
20 Feb 0516	WARNING: Geomagnetic K = 4	20/0515 - 1200
20 Feb 1915	WARNING: Geomagnetic K = 4	20/1914 - 2359
20 Feb 2055	WATCH: Geomagnetic Storm Category G1 predicted	
21 Feb 1712	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	21/1655
22 Feb 0122	WARNING: Geomagnetic K = 4	22/0122 - 0700
22 Feb 0240	ALERT: Geomagnetic K = 4	22/0239
23 Feb 1641	WARNING: Geomagnetic K = 4	23/1641 - 2359
23 Feb 2010	WATCH: Geomagnetic Storm Category G1 predicted	
23 Feb 2346	EXTENDED WARNING: Geomagnetic K = 4	23/1641 - 24/1300
24 Feb 0038	ALERT: Geomagnetic K = 4	24/0035
24 Feb 0048	WARNING: Geomagnetic K = 5	24/0047 - 1000
24 Feb 0135	ALERT: Geomagnetic K = 5	24/0135
24 Feb 1255	EXTENDED WARNING: Geomagnetic K = 4	23/1641 - 24/1800
24 Feb 1756	EXTENDED WARNING: Geomagnetic K = 4	23/1641 - 24/2359
24 Feb 2352	EXTENDED WARNING: Geomagnetic K = 4	23/1641 - 25/0600
25 Feb 1423	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	25/1400
26 Feb 2149	WATCH: Geomagnetic Storm Category G1 predicted	



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
27 Feb	79	5	2	13 Mar	75	5	2
28	77	12	4	14	75	5	2
01 Mar	77	25	5	15	74	10	3
02	79	20	5	16	75	20	5
03	79	15	4	17	77	15	4
04	79	8	3	18	79	10	3
05	75	5	2	19	80	8	3
06	72	5	2	20	82	5	2
07	72	5	2	21	82	8	3
08	73	5	2	22	82	10	3
09	74	5	2	23	82	15	4
10	75	5	2	24	80	8	3
11	75	5	2	25	80	5	2
12	75	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	Optical			Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #	
20 Feb	1122	1129	1137	B4.5			2638	
20 Feb	1151	1156	1201	B3.7			2638	
20 Feb	1343	1348	1351	B5.4	SF	N16E72	2638	
20 Feb	1414	1425	1432	B7.5				
20 Feb	1656	1703	1711	B3.7				
20 Feb	2310	2314	2320	B2.5			2638	
21 Feb	0514	0522	0526	B3.0			2638	
21 Feb	0641	0645	0650	B2.8			2638	
21 Feb	1120	1123	1125	B2.3			2638	
21 Feb	1127	1131	1133	B2.7			2638	
21 Feb	1134	1134	1136		SF	N21E60	2638	
21 Feb	1358	1401	1405	B2.9	SF	N23E60	2638	
21 Feb	2247	2253	2304	B3.0	SF	N18E53	2638	
22 Feb	0140	0151	0202	B6.8			2638	
22 Feb	1303	1327	1338	C4.1	1F	N22E48	2638	
22 Feb	2107	2113	2118	B4.9	SF	N17E41	2638	
23 Feb	0045	0105	0120	B4.4			2638	
23 Feb	1042	1054	1104	B4.8			2638	
23 Feb	1418	1428	1442	B2.4	SF	N19E34	2638	
23 Feb	1514	1514	1517		SF	N20E33	2638	
23 Feb	2017	2024	2027	B5.8	SF	N20E29	2638	
23 Feb	2036	2053	2117	C1.3	SF	N19E25	2638	
24 Feb	0004	0012	0014	C1.1	SF	N20E29	2638	
24 Feb	0606	0607	0614		SF	N21E18	2638	
26 Feb	2311	2318	2325	B3.2	SF	N09E27	2640	



Region Summary

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

Region 2636

15 Feb	N11E53	185	10		Axx	2	A										
16 Feb	N11E40	185	10	1	Hrx	2	A										
17 Feb	N11E27	185	20	3	Cro	4	B										
18 Feb	N11E15	183	20	2	Bxo	3	B										
19 Feb	N11E01	184	10		Axx	1	A										
20 Feb	N11W13	185	plage														
21 Feb	N11W27	186	plage														
22 Feb	N11W41	187	plage														
23 Feb	N11W55	188	plage														
24 Feb	N11W69	188	plage														
25 Feb	N11W83	189	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 184

Region 2637

19 Feb	S03E61	124	20	1	Axx	2	A										
20 Feb	S04E47	125	10	1	Axx	1	A										
21 Feb	S04E32	127	plage														
22 Feb	S04E17	129	plage														
23 Feb	S04E02	131	plage														
24 Feb	S04W13	132	plage														
25 Feb	S04W28	134	plage														
26 Feb	S04W43	136	plage														
									0	0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 131

Region 2638

20 Feb	N18E58	114	80	10	Dao	4	B					1					
21 Feb	N18E49	110	140	10	Dso	9	B					3					
22 Feb	N19E35	111	150	10	Dso	7	B	1				1	1				
23 Feb	N18E20	113	150	10	Cso	8	BG	1				4					
24 Feb	N18E08	111	120	6	Cso	5	B	1				2					
25 Feb	N18W03	109	100	5	Cso	2	B										
26 Feb	N18W16	109	100	2	Hsx	1	A										
									3	0	0	11	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 109



Region Summary - continued

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

Region 2639

24 Feb	S09W34	153	20	2	Hrx	2	A										
25 Feb	S08W48	154	20	2	Cro	3	B										
26 Feb	S08W61	154	10	2	Bxo	2	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 153

Region 2640

26 Feb	N11E24	69	10	2	Bxo	2	B				1						
								0	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 69

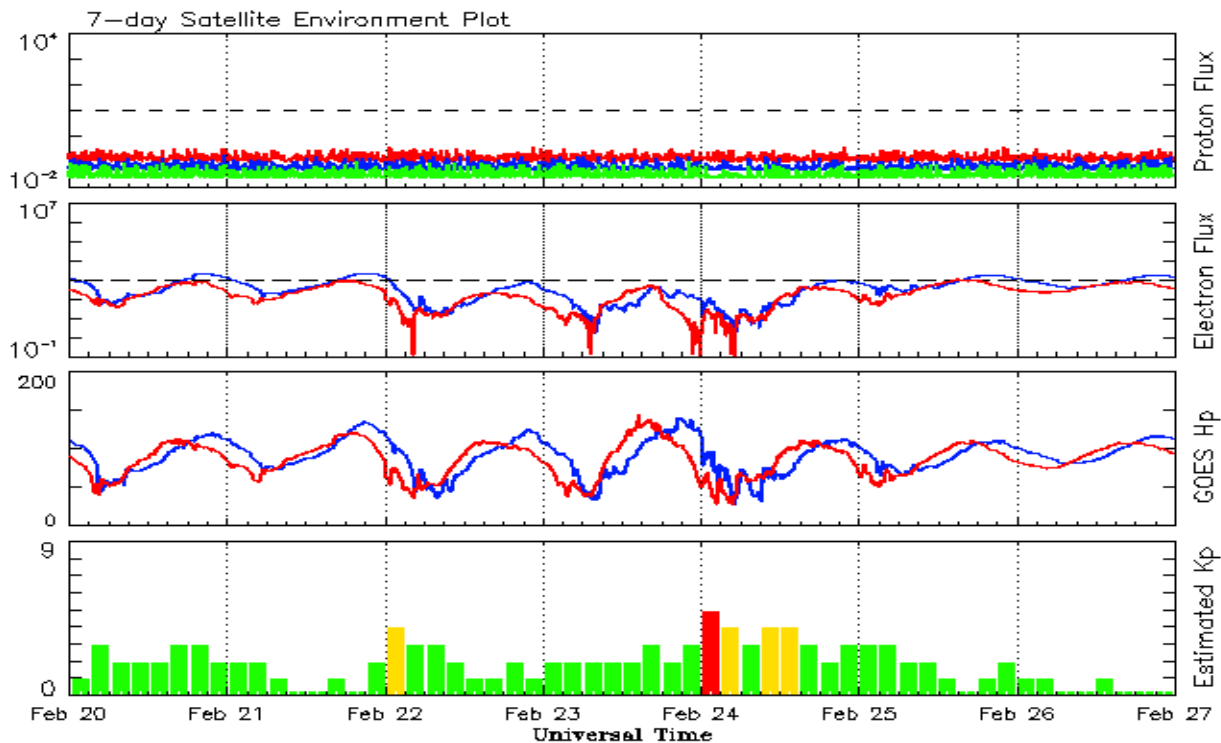


Recent Solar Indices (preliminary)
Observed monthly mean values

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									
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
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	23.2	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	
2017									
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 20 February 2017*

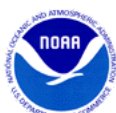
The proton flux plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

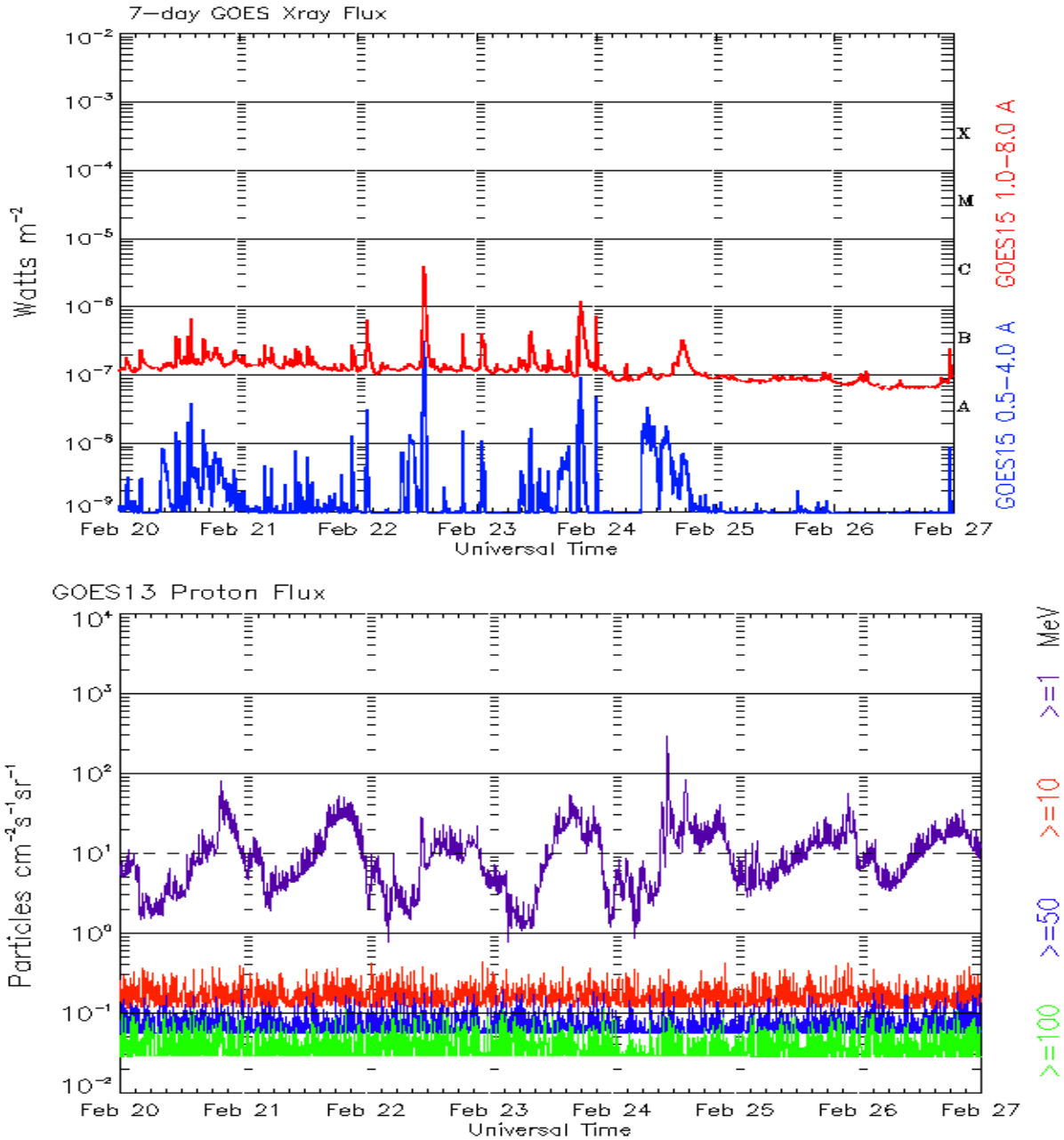
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 20 February 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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Space Weather Prediction Center
325 Broadway, Boulder CO 80305

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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