

Space Weather Highlights
20 February - 26 February 2012

SWPC PRF 1904
28 February 2012

Solar activity was at very low to low levels. Regions 1421 (N18, L=133, class/area = Cro/30 on 20 February) and 1422 (N15, L=177, class/area = Dsi/330 on 21 February) each produced isolated C-class activity, the largest a C4 at 20/0509 UTC from Region 1421. The most significant event of the period was a filament eruption from the northeast quadrant early on 24 February associated with an Earth-directed coronal mass ejection (CME).

No proton events were observed at geosynchronous orbit. An enhancement of the greater than 10 MeV proton flux at geosynchronous orbit began around 25/0300Z and continued through the remainder of the period (peak flux of 4.6 pfu at 26/0055 UTC). The enhancement was associated with the filament eruption observed on 24 February.

The greater than 2 MeV electron flux at geosynchronous orbit increased from normal to high levels during 20 - 22 February due to effects from a coronal hole high speed stream (CH HSS). Fluxes decreased to mostly moderate levels during 23 - 26 February.

Geomagnetic field activity was at unsettled to active levels with minor to major storm periods at high latitudes due to CH HSS effects. Activity decreased to quiet to unsettled levels on 21 February as CH HSS effects subsided. Quiet to unsettled levels were observed on 22 February with active periods at high latitudes due to the onset of another CH HSS. Activity dropped to mostly quiet levels on 23 February as CH HSS effects subsided. Mostly quiet to unsettled levels occurred during the remainder of the period (24 - 26 February) with the exception of isolated active to major storm levels at high latitudes on 25 February. A Sudden Impulse (19 nT) was observed on 26 February marking the arrival of the 24 February CME.

Space Weather Outlook
29 February - 26 March 2012

Solar activity is expected to be very low to low during the forecast period.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels from 29 February - 17 March. Flux is expected to increase to moderate to high levels on 18 - 19 March due to effects from a recurrent CH HSS. Predominately normal to moderate levels are expected for the remainder of the period.

Geomagnetic field activity is expected to begin with quiet to unsettled levels on 29 February as effects from the 24 February CME subside. Predominately quiet levels are expected during the forecast period. However, unsettled conditions are likely on 02, 05 - 07 and 11 March due to weak CH HSS effects and unsettled to active conditions are expected on 17 - 20 March due to a more prominent recurrent negative polarity CH HSS.



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	111	72	370	B2.4	3	0	0	4	0	0	0	0
21 February	103	61	390	B2.1	1	0	0	0	0	0	0	0
22 February	104	31	270	B1.8	0	0	0	0	0	0	0	0
23 February	103	52	280	B2.2	0	0	0	0	0	0	0	0
24 February	109	47	300	B2.7	0	0	0	0	0	0	0	0
25 February	108	47	310	B2.5	0	0	0	0	0	0	0	0
26 February	107	58	290	B2.3	2	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	4.0e+05	1.2e+04	2.9e+03		2.1e+07
21 February	2.0e+05	1.2e+04	3.2e+03		1.2e+08	
22 February	3.0e+05	1.3e+04	3.3e+03		3.9e+07	
23 February	2.0e+05	1.3e+04	3.2e+03		3.2e+07	
24 February	3.0e+05	1.3e+04	3.1e+03		3.4e+07	
25 February	1.3e+07	1.3e+05	3.0e+03		3.1e+07	
26 February	7.0e+07	2.3e+05	3.0e+03		3.2e+07	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	20 February	14	3-4-3-3-3-2-2-2	28	3-2-5-6-4-4-3-2	16
21 February	4	2-2-1-1-1-1-1-1	7	3-2-1-3-2-1-1-1	6	3-2-2-2-1-1-1-2
22 February	9	3-3-3-3-2-1-1-0	11	2-1-3-4-4-1-1-1	8	3-3-2-2-2-1-1-0
23 February	3	0-0-1-1-2-1-1-2	3	0-0-2-3-0-0-0-1	4	0-0-1-1-1-1-1-2
24 February	6	2-3-1-1-1-2-2-0	5	1-1-0-2-3-2-1-0	6	2-3-1-1-1-2-1-0
25 February	3	0-0-1-1-2-1-2-1	24	0-0-4-6-6-1-0-1	6	0-0-2-2-3-1-2-2
26 February	7	1-3-2-1-2-1-1-3	9	2-1-2-4-3-0-1-2	6	2-2-2-2-1-1-1-3

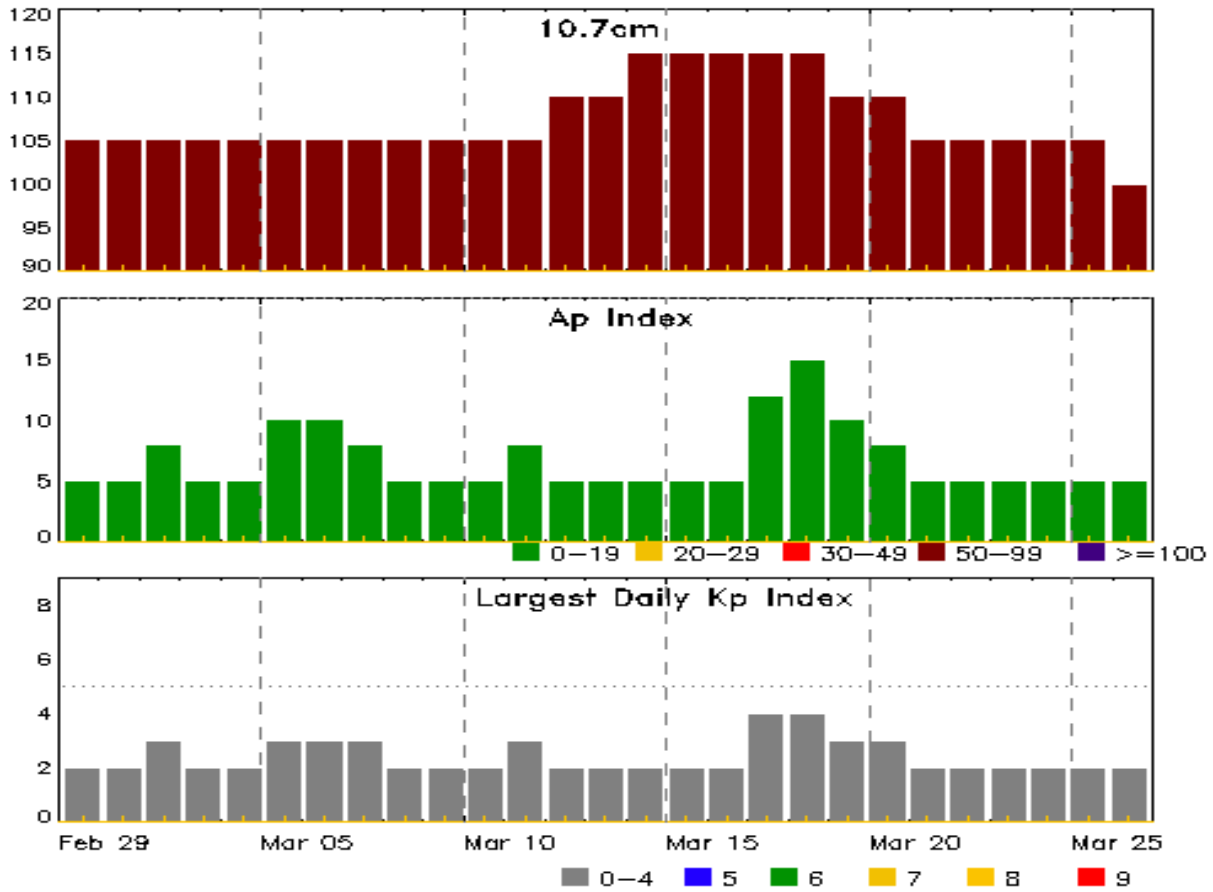


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
20 Feb 0339	WARNING: Geomagnetic K = 4	20/0339 - 0900
20 Feb 0340	ALERT: Geomagnetic K = 4	20/0339
20 Feb 0835	EXTENDED WARNING: Geomagnetic K = 4	20/0339 - 1500
20 Feb 1926	ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20/1905
20 Feb 2222	WARNING: Geomagnetic K = 4	20/2245 - 21/0600
21 Feb 1015	CONTINUED ALERT: Electron 2MeV Integral Flux \geq 1000pfu	20/1905
22 Feb 0145	WARNING: Geomagnetic Sudden Impulse expected	22/0205 - 0235
22 Feb 0150	WARNING: Geomagnetic K = 4	22/0205 - 0600
22 Feb 0230	SUMMARY: Geomagnetic Sudden Impulse	22/0223
22 Feb 0830	WARNING: Geomagnetic K = 4	22/0900 - 1500
26 Feb 2111	WARNING: Geomagnetic Sudden Impulse expected	26/2130 - 2200
26 Feb 2147	SUMMARY: Geomagnetic Sudden Impulse	26/2141



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
29 Feb	105	5	2	14 Mar	115	5	2
01 Mar	105	5	2	15	115	5	2
02	105	8	3	16	115	5	2
03	105	5	2	17	115	12	4
04	105	5	2	18	115	15	4
05	105	10	3	19	110	10	3
06	105	10	3	20	110	8	3
07	105	8	3	21	105	5	2
08	105	5	2	22	105	5	2
09	105	5	2	23	105	5	2
10	105	5	2	24	105	5	2
11	105	8	3	25	105	5	2
12	110	5	2	26	100	5	2
13	110	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 Location Lat CMD	Optical Rgn #
	Begin	Max	End				
20 Feb	0121	0146	0149	B7.2	SF	N15E01	1422
20 Feb	0339	0346	0352	C1.1			1422
20 Feb	0441	0509	0535	C4.1	SF	N17E47	1421
20 Feb	0626	0626	0629		SF	N12E44	1421
20 Feb	1120	1127	1132	C1.1			1422
20 Feb	2339	2353	0003	B9.3	SF	N13W10	1422
21 Feb	1142	1148	1155	C1.0			1422
21 Feb	1932	1937	1941	B5.0			1422
21 Feb	2037	2041	2045	B4.5			1422
24 Feb	0045	0049	0055	B4.5			
24 Feb	1321	1324	1330	B4.7			
25 Feb	1420	1500	1515	B5.9			1424
25 Feb	1553	1556	1558	B4.6			1424
25 Feb	2046	2050	2058	B4.0			
25 Feb	2205	2211	2216	B4.8			
26 Feb	0211	0215	0218	B4.2			1422
26 Feb	0407	0410	0414	B3.5			
26 Feb	0909	0955	1033	B5.2			
26 Feb	1119	1125	1134	C1.3			1421
26 Feb	2135	2141	2149	C2.3	SF	N17W45	1421
26 Feb	2329	2333	2335	B7.0			1422



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 1417

10 Feb	N18E59	239	10	1	Bxo	2	B										
11 Feb	N16E44	241	20	4	Cro	3	B										
12 Feb	N18E32	240	30	4	Cso	5	B										
13 Feb	N18E18	240	plage														
14 Feb	N18E04	241	plage														
15 Feb	N18W10	242	plage														
16 Feb	N18W24	243	plage														
17 Feb	N18W38	244	plage														
18 Feb	N18W52	244	plage														
19 Feb	N18W66	245	plage														
20 Feb	N18W80	246	plage														
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 241

Region 1418

12 Feb	S24E13	259	10	3	Bxo	4	B										
13 Feb	S24W01	259	10	5	Bxo	5	B										
14 Feb	S24W13	257	10	5	Bxo	6	B										
15 Feb	S24W27	259	plage														
16 Feb	S24W41	260	plage														
17 Feb	S23W55	261	10	3	Bxo	5	B										
18 Feb	S23W69	261	30	5	Cro	5	B										
19 Feb	S23W84	263	20		Cso	3	B										
									0	0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 259



Region Summary - continued

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	4		
Region 1419																	
12 Feb	N28E69	203	80	4	Cso	4	B	3			1						
13 Feb	N26E59	200	60	3	Cso	2	B										
14 Feb	N31E44	200	70	3	Dsi	2	B										
15 Feb	N29E29	203	50	3	Dso	2	B										
16 Feb	N28E19	200	60	4	Cso	3	B										
17 Feb	N28E06	200	40	4	Cso	6	B										
18 Feb	N29W05	197	30	3	Cso	4	B										
19 Feb	N29W18	197	20	2	Cso	3	B										
20 Feb	N29W31	196	20	2	Cro	3	B										
21 Feb	N27W44	197	10	1	Axx	1	A										
22 Feb	N27W58	198	plage														
23 Feb	N27W72	199	plage														
24 Feb	N27W86	200	plage														
								7	0	0	1	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 197

Region 1420																	
12 Feb	N13E69	203	50	4	Hsx	1	A										
13 Feb	N09E64	200	110	3	Hsx	1	A										
14 Feb	N13E48	197	90	2	Hsx	1	A										
15 Feb	N11E36	195	70	1	Hsx	1	A										
16 Feb	N10E23	196	80	2	Hsx	1	A										
17 Feb	N11E10	196	90	2	Hsx	1	A										
18 Feb	N11W04	196	80	2	Hsx	1	A										
19 Feb	N11W16	195	70	2	Hsx	1	A										
20 Feb	N11W30	195	60	3	Cso	2	B										
21 Feb	N11W44	196	30	1	Hrx	1	A										
22 Feb	N11W57	196	30	1	Hrx	1	A										
23 Feb	N11W71	198	30	1	Hrx	1	A										
24 Feb	N11W85	198	10	1	Axx	1	A										
								0	0	0	0	0	0	0	0	0	

Crossed West Limb.
 Absolute heliographic longitude: 196



Region Summary - continued

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	4							
Region 1421																							
18 Feb	N17E59		133	10	1	Axx	2	A															
19 Feb	N18E46		133	10	1	Axx	2	A															
20 Feb	N18E32		133	30	2	Cro	2	B	1				2										
21 Feb	N14E19		133	20	5	Bxo	4	B															
22 Feb	N14E05		135	plage																			
23 Feb	N14W06		133	0	1	Axx	1	A															
24 Feb	N14W20		134	plage																			
25 Feb	N14W34		134	plage																			
26 Feb	N14W48		135	plage					2				1										
									3	0	0		3	0	0	0	0	0					

Still on Disk.

Absolute heliographic longitude: 135

Region 1422

19 Feb	N15E02		177	60	6	Dai	10	B	1				1									
20 Feb	N16W11		176	240	6	Dai	12	B	2				2									
21 Feb	N15W24		177	330	6	Dsi	15	B	1													
22 Feb	N15W38		177	240	5	Dsi	10	B														
23 Feb	N15W52		179	130	5	Cao	9	B														
24 Feb	N15W65		178	150	5	Cao	4	B														
25 Feb	N15W78		178	180	4	Cao	3	B														
26 Feb	N15W90		177	150	3	Cao	3	B														
									4	0	0		3	0	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 177

Region 1423

23 Feb	N18E70		57	120	2	Hsx	1	A														
24 Feb	N18E56		57	110	2	Hsx	1	A														
25 Feb	N18E42		58	90	2	Hsx	1	A														
26 Feb	N17E29		58	90	2	Hsx	1	A														
									0	0	0		0	0	0	0	0	0				

Still on Disk.

Absolute heliographic longitude: 58



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 1424

24 Feb	N09E68	45	30	1	Hrx	1	A										
25 Feb	N08E52	48	30	3	Cso	2	B										
26 Feb	N07E39	48	20	1	Hrx	1	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 48

Region 1425

26 Feb	N18E12	75	10	1	Hrx	1	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 75

Region 1426

26 Feb	N10E12	75	20	4	Dro	2	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 75

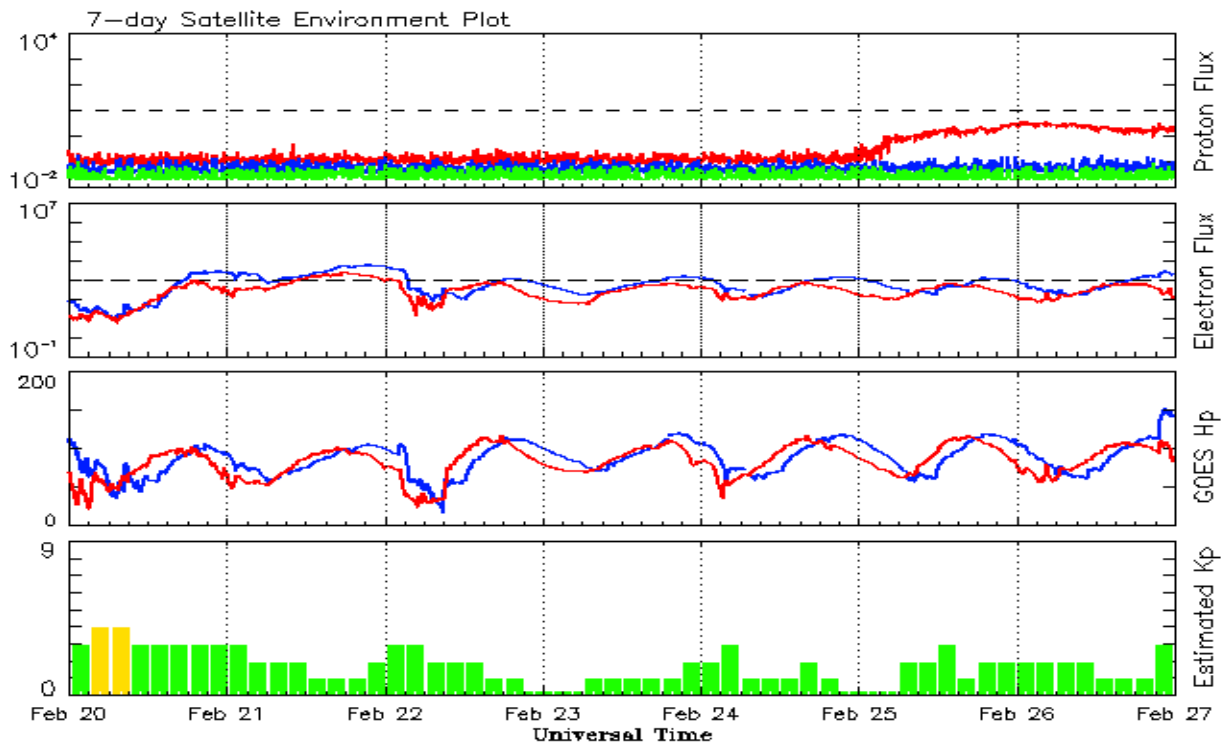


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2010									
February	31.0	18.8	0.60	16.7	10.6	84.7	76.5	5	5.1
March	24.7	15.4	0.62	19.1	12.3	83.3	77.5	5	5.3
April	11.2	8.0	0.71	21.4	14.0	75.9	78.3	10	5.5
May	19.9	8.7	0.44	23.8	15.5	73.8	79.0	8	5.7
June	17.9	13.6	0.75	25.2	16.4	72.6	79.7	7	5.8
July	23.1	16.1	0.70	25.9	16.7	79.9	80.1	5	6.0
August	28.2	19.6	0.70	27.3	17.4	79.7	80.7	8	6.2
September	35.6	25.2	0.71	30.6	19.6	81.1	82.4	5	6.3
October	35.0	23.5	0.67	35.9	23.2	81.6	85.3	6	6.4
November	36.1	21.5	0.60	40.5	26.5	82.5	87.7	5	6.4
December	22.0	14.4	0.66	43.8	28.8	84.3	89.6	4	6.5
2011									
January	32.1	18.8	0.59	47.2	30.9	83.7	91.2	6	6.7
February	53.2	29.6	0.55	50.6	33.4	94.5	92.7	6	6.8
March	81.0	55.8	0.69	55.2	36.9	115.3	95.8	7	7.2
April	81.7	54.4	0.67	61.5	41.8	112.6	100.4	9	7.5
May	61.4	41.5	0.68	69.0	47.6	95.9	105.6	9	7.5
June	55.5	37.0	0.67	76.5	53.2	95.8	110.9	8	7.4
July	67.0	43.8	0.66	82.5	57.2	94.2	115.4	9	7.3
August	66.1	50.6	0.77			101.7		8	
September	106.4	78.0	0.73			134.5		13	
October	116.8	88.0	0.75			137.2		7	
November	133.1	96.7	0.73			153.1		3	
December	106.3	29.6	0.28		33.4	141.2		3	
2012									
January	91.3	58.3	0.64			133.1		6	

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 2012*

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.

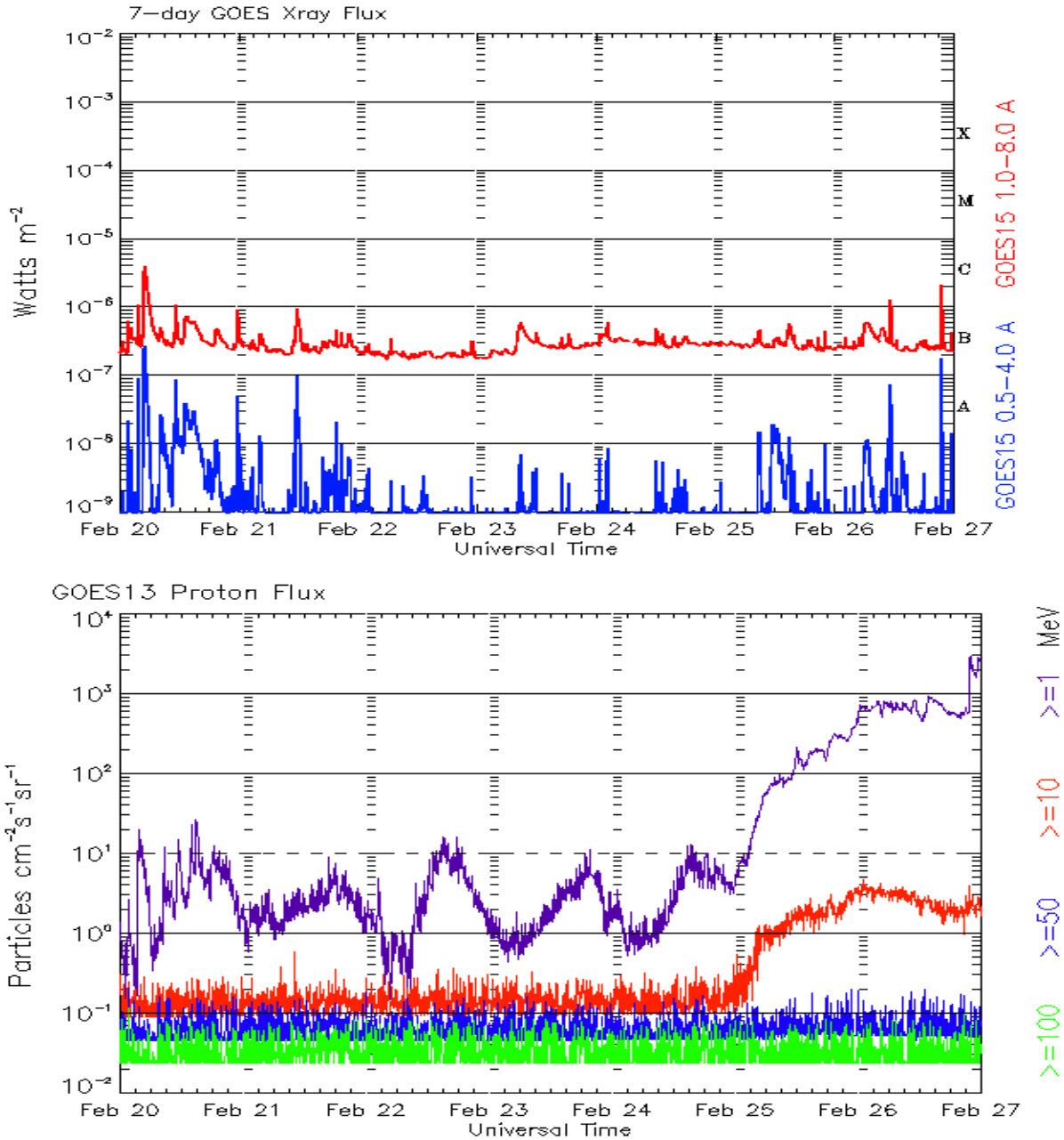
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 2012*

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)

Published every Tuesday by the Space Weather Prediction Center.

U.S. Department of Commerce
NOAA / National Weather Service
Space Weather Prediction Center
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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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