

Space Weather Highlights
11 February - 17 February 2013

SWPC PRF 1955
18 February 2013

Solar activity was moderate. The largest flare of the period was a M1/Sf with an associated Tenflare (340 sfu) radio burst from Region 1675 (N12, L=37, class/area Cso/050 on 17 February) at 17/1550 UTC. The largest and most magnetically complex region of the period was Region 1670 (N17, L166, class/area Dai/170 on 12 February). It managed to produce two C-class flares before finally rotating off the west limb on 16 February. Two filament eruptions occurred near the southwest quadrant during the period. The first, a 7-degree long filament located near S26W63, erupted beginning at approximately 12/2200 UTC. The second, a 10-degree long filament located near S29W48, erupted at approximately 13/0300 UTC. It was later determined that neither coronal mass ejection (CME) associated with these filaments had a substantial Earthward trajectory. Several other non-Earth directed CMEs were observed throughout the period as well. However, late in the period a NE limb event showed a potential Earth-directed CME. The ejecta was shown to be moving slowly (approximately 300-400 km/s) using the plane-of-sky estimate but is anticipated to be caught up in a coronal hole high speed stream (CH HSS) and be nearly imperceptible as it passes.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels.

Geomagnetic field activity was quiet to unsettled with a couple of isolated active periods. The first was on 13 February from 21000-2400 UTC due to prolonged periods of sustained negative Bz. The second occurred on 16 February from 1500-1800 UTC due to the passage of a weak transient CME.

Space Weather Outlook
18 February - 16 March 2013

Solar activity is expected to be very low to low.

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 18-23 February in response to negative polarity CH HSS from CH95 and CH96, and again from 1-2 March due to a recurrent negative polarity CH HSS.

Geomagnetic field activity is expected to be predominantly quiet to unsettled with a slight chance for isolated active periods due to the effects of the negative polarity CHs mentioned previously.



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
11 February	105	60	370	B1.8	0	0	0	1	0	0	0	0
12 February	102	55	340	B1.8	1	0	0	1	0	0	0	0
13 February	100	26	210	B1.6	0	0	0	0	0	0	0	0
14 February	100	25	200	B1.7	1	0	0	0	0	0	0	0
15 February	100	59	220	B2.1	0	0	0	1	0	0	0	0
16 February	103	75	240	B2.0	0	0	0	0	0	0	0	0
17 February	106	74	250	B2.3	3	1	0	7	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
	11 February	5.1e+05	1.2e+04	2.9e+03		1.8e+06
12 February	2.0e+05	1.2e+04	2.9e+03		1.1e+06	
13 February	2.2e+05	1.2e+04	2.8e+03		9.1e+05	
14 February	2.3e+05	1.2e+04	2.7e+03		1.8e+06	
15 February	1.8e+05	1.2e+04	2.9e+03		4.3e+06	
16 February	2.6e+05	1.1e+04	2.8e+03		5.9e+06	
17 February	2.5e+05	1.1e+04	2.7e+03		8.7e+05	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	11 February	3	1-1-1-0-0-1-2-1	2	1-0-1-0-0-0-1-1	4
12 February	3	0-0-0-0-2-1-2-2	2	0-0-0-1-2-1-1-1	4	1-0-0-1-1-2-1-2
13 February	9	2-2-1-1-2-1-3-4	7	2-2-1-3-2-0-2-2	11	2-2-1-1-1-1-3-4
14 February	11	3-3-3-3-2-2-2-1	27	3-3-4-6-5-4-1-0	10	3-3-3-3-2-1-2-1
15 February	3	0-1-2-1-1-1-1-1	2	1-0-1-1-1-1-1-0	4	0-1-1-1-1-1-1-1
16 February	6	1-0-0-1-2-3-3-1	11	0-0-0-3-2-5-3-1	8	1-0-0-1-2-4-3-1
17 February	7	1-2-1-2-3-2-2-1	23	0-1-1-4-6-5-3-2	8	1-2-2-2-3-2-3-2

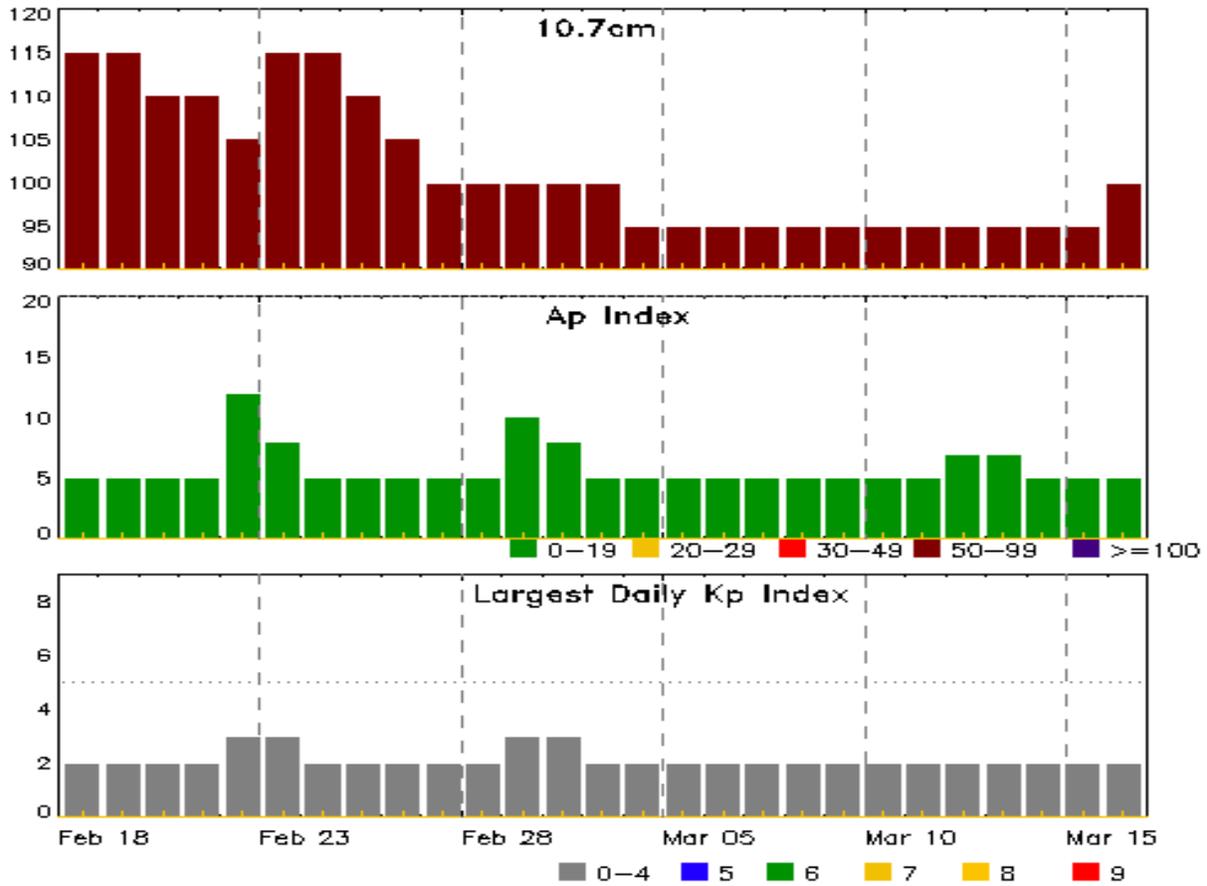


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
13 Feb 2320	WARNING: Geomagnetic K = 4	13/2319 - 14/1200
13 Feb 2327	ALERT: Geomagnetic K = 4	13/2325
13 Feb 2339	WARNING: Geomagnetic K = 5	13/2338 - 14/0600
14 Feb 0347	CANCELLATION: Geomagnetic K = 5	
14 Feb 1157	EXTENDED WARNING: Geomagnetic K = 4	13/2319 - 14/1800
16 Feb 1145	WARNING: Geomagnetic Sudden Impulse expected	16/1145 - 1215
16 Feb 1217	SUMMARY: Geomagnetic Sudden Impulse	16/1210
16 Feb 1713	WARNING: Geomagnetic K = 4	16/1711 - 2359
16 Feb 1735	ALERT: Geomagnetic K = 4	16/1730
17 Feb 1601	SUMMARY: 10cm Radio Burst	17/1547 - 1551



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
18 Feb	115	5	2	04 Mar	95	5	2
19	115	5	2	05	95	5	2
20	110	5	2	06	95	5	2
21	110	5	2	07	95	5	2
22	105	12	3	08	95	5	2
23	115	8	3	09	95	5	2
24	115	5	2	10	95	5	2
25	110	5	2	11	95	5	2
26	105	5	2	12	95	7	2
27	100	5	2	13	95	7	2
28	100	5	2	14	95	5	2
01 Mar	100	10	3	15	95	5	2
02	100	8	3	16	100	5	2
03	100	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 #	245	2695	II	IV
17 Feb	1545	1550	1552	M1.9	0.003			1675	6700	340		

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
11 Feb	0622	0625	0629	B5.4	SF	N16W23	1670
11 Feb	1604	1612	1619	B5.8			1670
11 Feb	1855	1905	1915	B5.8			1667
12 Feb	1747	1755	1801	C1.5	SF	N19W37	1670
12 Feb	1952	1956	1959	B4.3			1670
13 Feb	0042	0045	0050	B8.0			1670
13 Feb	1022	1046	1059	B4.6			1670
13 Feb	1804	1810	1821	B2.7			
13 Feb	1846	1854	1903	B3.2			1670
14 Feb	0357	0402	0408	B3.2			1670
14 Feb	0412	0430	0438	C1.0			1670
15 Feb	0155	0201	0208	B5.1			1670
15 Feb	1536	1539	1542	B4.7			1673
15 Feb	1545	1546	1548		SF	S08E80	1673
16 Feb	1345	1356	1400	B3.8			1670
16 Feb	2259	2302	2308	B4.7			1675
16 Feb	2337	2341	2348	B5.3			1675
17 Feb	0021	0023	0024		SF	N13E32	1675
17 Feb	0031	0036	0038	C1.0	SF	N13E32	1675
17 Feb	0420	0431	0445	B5.6	SF	N13E30	1675
17 Feb	1034	1038	1046	B3.8			1675
17 Feb	1526	1540	1543	C2.5	SF	N12E22	1675
17 Feb	1545	1550	1552	M1.9			1675
17 Feb	1621	1623	1630		SF	N12E22	1675
17 Feb	1759	1810	1815	B3.7			
17 Feb	1957	2000	2002	C1.0			1675
17 Feb	2017	2020	2023	B5.5			1675
17 Feb	2047	2048	2053		SF	N12E19	1675
17 Feb	2112	2125	2132	B6.3	SF	N12E19	1675



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 1665																							
29 Jan	N12E61	243	220	2	Hax	1	A																
30 Jan	N11E49	242	180	3	Dso	2	B																
31 Jan	N11E37	242	150	2	Hax	3	A																
01 Feb	N12E23	242	120	4	Cao	4	B						2										
02 Feb	N10E09	242	140	6	Cao	6	B	1															
03 Feb	N10W04	242	190	4	Cso	5	B	1															
04 Feb	N10W18	242	170	3	Hsx	2	A																
05 Feb	N10W31	242	120	2	Hsx	1	A																
06 Feb	N12W44	245	120	2	Hsx	1	A																
07 Feb	N12W58	244	120	2	Hsx	1	A																
08 Feb	N13W72	244	120	2	Hsx	1	A																
09 Feb	N11W81	241	80	2	Hsx	1	A																
10 Feb	N10W93	239	60	2	Hsx	1	A																
								2	0	0	2	0	0	0	0	0							

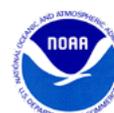
Crossed West Limb.

Absolute heliographic longitude: 242

Region 1667																							
01 Feb	N24E62	204	30	2	Cao	3	B						1										
02 Feb	N23E49	202	140	9	Dao	5	B	1					1										
03 Feb	N22E42	197	160	5	Dsi	14	B	3					8										
04 Feb	N22E28	197	90	6	Dso	8	B																
05 Feb	N22E14	197	80	6	Dso	6	B																
06 Feb	N22E01	200	100	6	Dso	6	B	1					1										
07 Feb	N22W13	199	100	6	Dso	6	B																
08 Feb	N23W25	197	80	6	Cso	4	B																
09 Feb	N23W37	197	70	6	Cso	2	B						1										
10 Feb	N22W50	197	60	1	Hsx	1	A																
11 Feb	N22W63	200	50	1	Hsx	1	A																
12 Feb	N22W77	201	40	1	Hsx	1	A																
								5	0	0	11	1	0	0	0								

Died on Disk.

Absolute heliographic longitude: 200



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares									
	Lat	CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical					
			Lon	10 ⁶ hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4	
Region 1669																	
05 Feb	N08E52		159	10	4	Bxo	4	B	1				1				
06 Feb	N08E38		162	10	1	Axx	2	A	1				1				
07 Feb	N08E24		162	20	8	Cro	6	B									
08 Feb	N07E11		162	10	1	Axx	2	A									
09 Feb	N07W02		162	plage													
10 Feb	N07W17		164	plage													
11 Feb	N07W31		167	plage													
12 Feb	N07W45		169	plage													
13 Feb	N07W59		170	plage													
14 Feb	N07W73		170	plage													
15 Feb	N07W88		169	plage													
									4	0	0	2	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 162

Region 1670

07 Feb	N18E25		161	30	4	Dro	5	B									
08 Feb	N19E12		161	70	5	Dao	10	B					1				
09 Feb	N19W01		161	150	8	Dsi	25	BG									
10 Feb	N17W14		161	160	7	Dsi	13	BG									
11 Feb	N17W28		164	160	7	Dsi	13	B					1				
12 Feb	N17W42		166	170	8	Dai	12	BG	1				1				
13 Feb	N17W55		166	110	8	Dso	5	B									
14 Feb	N17W69		166	100	8	Cao	4	B	1								
15 Feb	N17W85		166	70	9	Cao	3	B									
									2	0	0	3	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 161



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁻⁶ hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical							
								C	M	X	S	1	2	3	4			
Region 1671																		
11 Feb	N14E58		76	150	2	Hsx	1	A										
12 Feb	N14E44		78	120	2	Hsx	1	A										
13 Feb	N14E31		79	100	2	Hsx	1	A										
14 Feb	N14E17		80	100	2	Hsx	1	A										
15 Feb	N14E04		77	90	2	Hsx	1	A										
16 Feb	N14W08		78	90	4	Cso	3	B										
17 Feb	N14W21		76	90	4	Hsx	1	A										
									0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 77

Region 1672																		
11 Feb	S18E39		95	10	3	Cro	5	B										
12 Feb	S18E25		98	10	1	Axx	1	A										
13 Feb	S18E12		99	plage														
14 Feb	S18W02		99	plage														
15 Feb	S17W15		96	10	1	Axx	1	A										
16 Feb	S17W29		97	10	1	Axx	1	A										
17 Feb	S17W43		98	plage														
									0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 99

Region 1673																		
15 Feb	S11E67		13	40	2	Hsx	1	A				1						
16 Feb	S10E56		12	100	5	Cso	11	B										
17 Feb	S10E43		12	70	7	Cao	5	B										
									0	0	0	1	0	0	0	0	0	

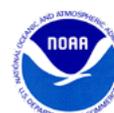
Still on Disk.

Absolute heliographic longitude: 12

Region 1674																		
15 Feb	N14W03		84	10	2	Bxo	3	B										
16 Feb	N14W17		85	plage														
17 Feb	N14W31		86	plage														
									0	0	0	0	0	0	0	0	0	

Still on Disk.

Absolute heliographic longitude: 84



Region Summary - continued

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

Region 1675

16 Feb	N12E31	36	10	3	Bxo	9	B											
17 Feb	N12E18	37	50	6	Cso	13	BG	3	1		7							
								3	1	0	7	0	0	0	0			

Still on Disk.

Absolute heliographic longitude: 37

Region 1676

16 Feb	S18E78	350	30	2	Hax	1	A											
17 Feb	S18E64	350	30	2	Hsx	2	A											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 350

Region 1677

17 Feb	S27E65	350	10	2	Bxo	3	B											
								0	0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 350

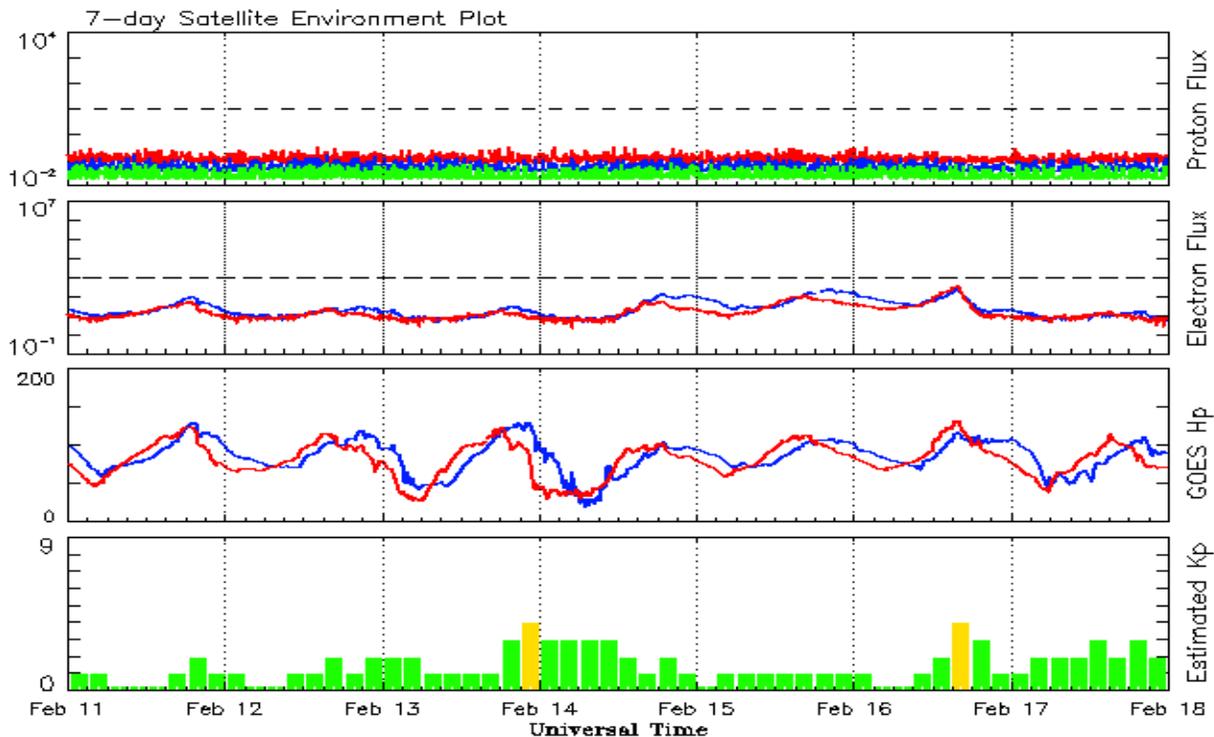


Recent Solar Indices (preliminary)
Observed monthly mean values

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
2011									
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	41.6	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	57.3	94.2	115.4	9	7.3
August	66.1	50.6	0.77	84.9	59.0	101.7	117.9	8	7.4
September	106.4	78.0	0.73	84.6	59.5	134.5	118.4	13	7.7
October	116.8	88.0	0.75	84.6	59.9	137.2	118.4	7	8.0
November	133.1	96.7	0.73	86.3	61.1	153.1	119.5	3	8.0
December	106.3	73.0	0.69	89.2	63.4	141.2	121.6	3	8.0
2012									
January	91.3	58.3	0.64	92.0	65.5	133.1	124.4	6	8.3
February	50.1	32.9	0.66	94.2	66.9	106.7	126.7	7	8.4
March	77.9	64.3	0.82	94.1	66.8	115.1	126.8	14	8.1
April	84.4	55.2	0.65	91.3	64.6	113.1	125.8	9	8.0
May	99.5	69.0	0.69	87.7	61.7	121.5	123.8	8	8.2
June	88.6	64.5	0.73	83.9	58.9	120.5	121.1	10	8.3
July	99.6	66.5	0.67	82.4	57.7	135.6	119.5	13	8.3
August	85.8	63.0	0.74			115.7		7	
September	84.0	61.4	0.73			123.2		8	
October	73.5	53.3	0.73			123.3		9	
November	89.2	61.4	0.69			120.9		6	
December	60.4	40.8	0.68			108.4		3	
2013									
January	99.8	62.9	0.63			127.1		4	

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 11 February 2013*

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.

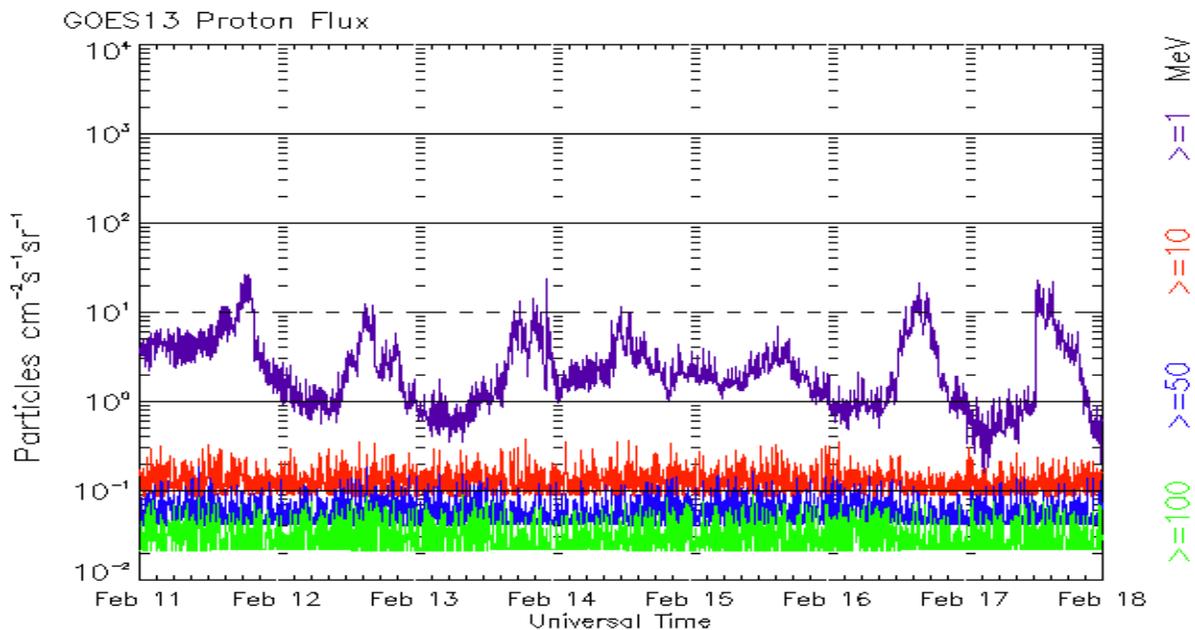
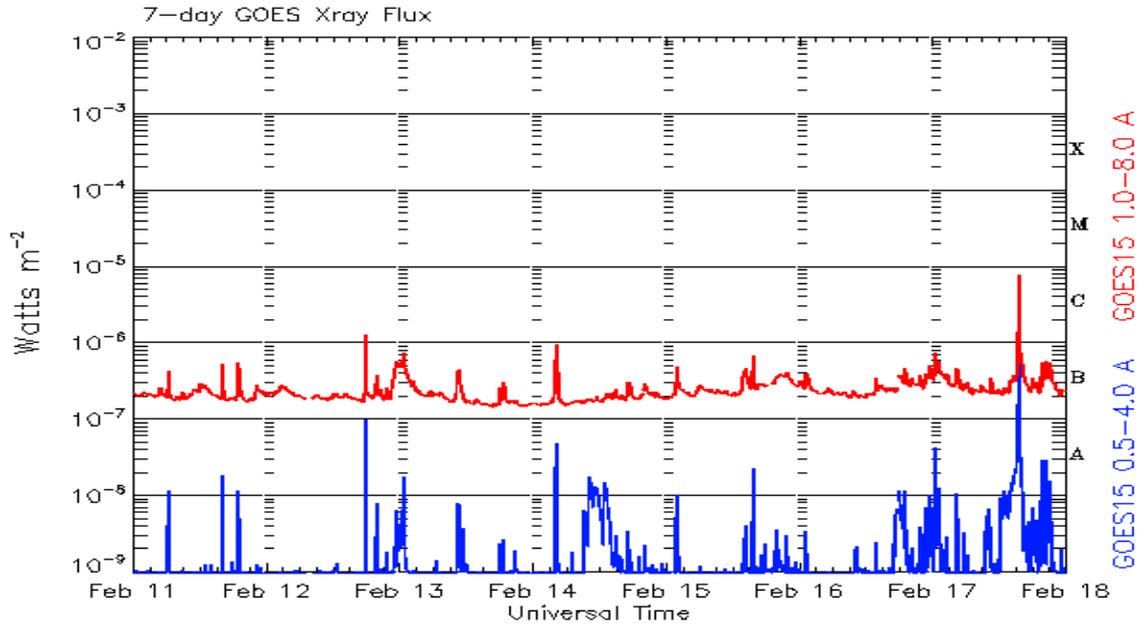
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

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 11 February 2013

The x-ray plots contains five-minute averages x-ray flux ($Watt/m^2$) 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^2 -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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http://spaceweather.gov/weekly/Usr_guide.pdf -- User Guide

