

Space Weather Highlights
31 January – 06 February 2005

SWO PRF 1536
08 February 2005

Solar activity was at very low to low levels. Low levels were observed on 31 January and 04 – 06 February while very low levels occurred on 01 - 03 February. On 01 February, a backside, full halo CME produced a Type II (660 km/s) radio sweep and 9800 sfu burst on 245 MHz. The likely source of this event was from old Region 720 (N13, L=178). The majority of this period's activity occurred on 04 February as multiple C-class flares were observed from a source region on the east limb near N14; the largest was a C7.1 at 04/2357 UTC. This activity heralded the return of old Region 720. On 05 February, returning Region 720 rotated into view and was numbered Region 732 (N09, L=176, class/area, Dao/040 on 06 February). Initial analysis of the region indicated a fair amount of magnetic complexity; however, the region had decayed considerably since its previous transit on the visible disk. Only isolated low-level C-class activity was observed since its return on 05 February.

Solar wind data were available from the NASA Advanced Composition Explorer (ACE) spacecraft during most of the summary period. The period began with solar wind speed near 600 km/s as waning effects of a trans-equatorial coronal hole were still present. By midday on the 31st, wind speed increased to near 700 km/s and the IMF Bz oscillated +/- 10 nT through the end of the day. From 01 – 05 February, the IMF Bz became mostly neutral and did not vary much beyond +/- 5 nT, while solar wind speed gradually decayed and ended the 5th near 400 km/s. Early on 06 February, a solar sector boundary crossing was observed at ACE. The IMF Bz responded with a slight increase in variability to +/- 7 nT and a corresponding increase in wind speed to near 500 km/s. These conditions persisted through the end of the summary period.

No greater than 10 MeV proton events were observed this period.

The greater than 2 MeV electron flux at geosynchronous orbit was at high levels from 31 January through early on 06 February.

The geomagnetic field ranged from quiet to minor storm levels with isolated major to severe storming at high latitudes. Quiet to minor storm conditions were observed at middle latitudes through late on 31 January, while major to severe storm periods were observed at higher latitudes midday on the 31st. The remainder of the summary period was at mostly quiet to unsettled levels with some isolated active periods at all latitudes early on the 3rd and again on the 6th of February.

Space Weather Outlook
09 February - 07 March 2005

Solar activity is expected to be mostly low with isolated moderate activity possible through 19 February. Thereafter, very low to low levels are expected.

A greater than 10 MeV proton event is not expected.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels on 08 – 10 February, and 26 February – 02 March.

The geomagnetic field is expected to range from quiet to minor storm levels. Coronal hole high speed wind streams are expected to produce unsettled to active levels with occasional minor storm periods on 09 February, 25 – 28 February, and 07 March. Otherwise, expect quiet to unsettled conditions.



Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 ⁻⁶ hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
31 January	86	49	180	A4.4	1	0	0	1	0	0	0	0
01 February	84	27	170	A4.0	0	0	0	0	0	0	0	0
02 February	82	28	150	A4.5	0	0	0	0	0	0	0	0
03 February	83	23	50	A7.6	0	0	0	0	0	0	0	0
04 February	82	22	80	B1.3	4	0	0	0	0	0	0	0
05 February	95	22	40	B2.1	1	0	0	0	0	0	0	0
06 February	97	47	140	B1.8	1	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)		
	>1MeV	>10MeV	>100MeV	>.6MeV	>2MeV	>4MeV
	31 January	7.7E+6	2.8E+4	3.2E+3		6.0E+7
01 February	1.3E+6	1.9E+4	3.1E+3		9.5E+7	
02 February	2.1E+6	1.9E+4	3.1E+3		1.5E+8	
03 February	2.0E+6	1.8E+4	3.0E+3		1.0E+8	
04 February	9.9E+5	1.6E+4	3.1E+3		1.0E+8	
05 February	1.8E+6	1.5E+4	3.1E+3		1.3E+8	
06 February	1.5E+6	1.6E+4	2.9E+3		1.5E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	31 January	15	3-2-3-4-4-3-2-1	43	2-2-3-6-7-6-3-1	19
01 February	4	3-0-1-1-1-1-1-1	6	2-0-0-3-3-2-0-1	6	3-0-1-2-1-2-2-2
02 February	7	1-2-2-2-1-2-3-1	8	0-0-3-3-2-3-2-1	8	1-1-3-2-2-2-3-1
03 February	5	1-3-2-1-1-1-1-0	9	0-4-4-3-1-0-1-0	8	1-4-3-1-1-2-1-1
04 February	2	0-0-0-1-1-1-1-0	2	0-0-0-2-2-1-0-0	3	0-0-0-1-2-1-1-1
05 February	1	0-0-1-0-1-0-0-0	0	0-0-0-0-1-0-0-0	4	1-1-1-0-1-0-1-1
06 February	6	0-2-3-1-1-1-2-2	8	0-2-4-2-0-2-2-2	9	2-2-4-1-1-1-2-3

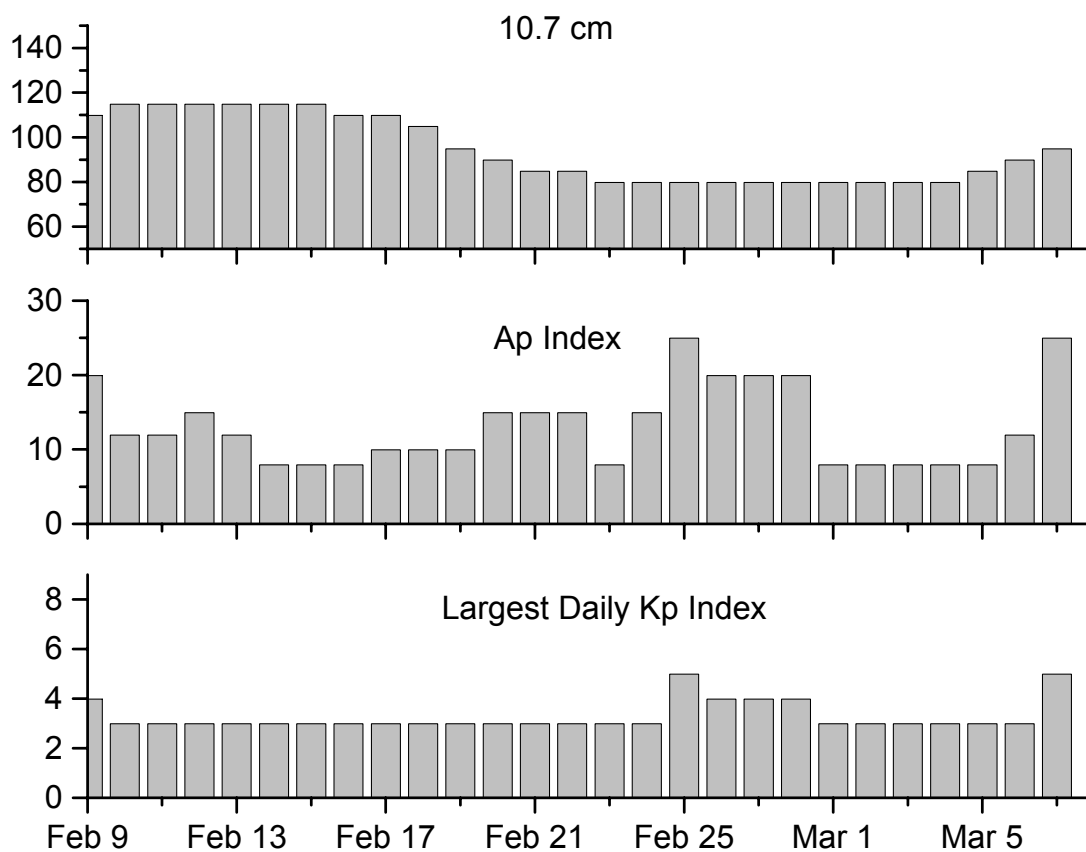


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UTC</u>
31 Jan 0216	WARNING: Geomagnetic K = 4	31 Jan 0216 - 1500
31 Jan 0256	ALERT: Geomagnetic K = 4	31 Jan 0255
31 Jan 1415	WARNING: Geomagnetic K = 5	31 Jan 1415 - 1600
31 Jan 1555	WARNING: Geomagnetic K = 4	31 Jan 1600 - 2359
31 Jan 1708	ALERT: Electron 2MeV Integral Flux > 1000pfu	31 Jan 1645
31 Jan 2319	EXTENDED WARNING: Geomagnetic K= 4	31 Jan 1600 -01 Feb 1500
01 Feb 1055	ALERT: Type II Radio Emission	01 Feb 1032
01 Feb 1149	ALERT: Electron 2MeV Integral Flux > 1000pfu	01 Feb 1125
02 Feb 0022	1 – 245 MHz Radio Burst	01 Feb
02 Feb 0920	ALERT: Electron 2MeV Integral Flux > 1000pfu	02 Feb 0900
03 Feb 0415	WARNING: Geomagnetic K = 4	03 Feb 0416 - 1500
03 Feb 0432	ALERT: Geomagnetic K = 4	03 Feb 0430
03 Feb 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Feb 0500
04 Feb 0911	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Feb 0850
05 Feb 0832	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Feb 0810
06 Feb 0750	WARNING: Geomagnetic K = 4	06 Feb 0750 - 1600
06 Feb 0754	ALERT: Geomagnetic K = 4	06 Feb 0753



Twenty-seven Day Outlook



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
09 Feb	110	20	4	23 Feb	80	8	3
10	115	12	3	24	80	15	3
11	115	12	3	25	80	25	5
12	115	15	3	26	80	20	4
13	115	12	3	27	80	20	4
14	115	8	3	28	80	20	4
15	115	8	3	01 Mar	80	8	3
16	110	8	3	02	80	8	3
17	110	10	3	03	80	8	3
18	105	10	3	04	80	8	3
19	95	10	3	05	85	8	3
20	90	15	3	06	90	12	3
21	85	15	3	07	95	25	5
22	85	15	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½ Max	Class	Flux	Imp/	Location	Rgn	Radio Flux		Intensity	
						Brtns	Lat CMD	#	245	2695	II	IV

No Events Observed

Flare List

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
31 January	0400	0403	0405	B1.1			
	0435	0439	0441	B4.5			
	0515	0518	0520	B1.7			
	0526	0529	0531	B2.3			
	0544	0548	0553	B1.5			
	0612	0618	0622	B5.9			
	0656	0705	0707	B5.1			
	0716	0720	0731	B2.8			
	0733	0737	0740	B3.7			
	0801	0805	0807	B2.0			
	0808	0812	0814	B2.0			
	0815	0818	0822	B2.9			
	0913	0914	0917	B3.3	Sf	S10E25	729
	0959	1005	1008	B1.7			
	1016	1020	1025	B2.0			
1046	1052	1058	C1.3			729	
1135	1139	1143	B1.2				
1413	1418	1423	B2.6				
01 February	No Flares Observed						
02 February	No Flares Observed						
03 February	0014	0025	0049	B1.2			
	0156	0204	0226	B1.1			
	0404	0412	0422	B1.0			
	0714	0723	0743	B3.9			
	1155	1202	1210	B3.5			
	2344	2349	0005	B1.0			
04 February	0258	0302	0304	B2.3			
	0557	0606	0614	B3.7			
	1318	1325	1330	B8.0			
	1502	1509	1516	C1.3			
	2111	2123	2129	B5.2			
	2229	2236	2239	C1.2			
	2303	2309	2336	C1.3			732
	2345	2357	0008	C7.1			732
05 February	0815	0832	0845	B8.5			732
	1805	1813	1821	C1.2			732
	2351	2357	0004	B3.5			732



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
06 February	0925	0939	0951	C1.2			732
	1152	1156	1201	B3.2			
	1324	1327	1331	B3.2			732
	1633	1645	1710	B8.2			732
	1800	1807	1813	B8.0			
	2155	2158	2200	B3.9			

Region Summary

Date	Location		Sunspot Characteristics				Flares								
	Helio		Area (10 ⁻⁶ hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
	(° Lat ° CMD)	Lon						C	M	X	S	1	2	3	4

Region 727

24 Jan	S09E38	019	0320	05	Dai	008	B												
25 Jan	S09E25	019	0120	06	Dai	013	B												
26 Jan	S09E11	019	0100	06	Dao	013	B												
27 Jan	S09W02	019	0080	07	Dao	010	B												
28 Jan	S05W16	020	0070	08	Dai	010	B												
29 Jan	S10W26	017	0070	05	Dso	008	B												
30 Jan	S09W42	020	0110	07	Dai	016	Bg												
31 Jan	S09W53	017	0110	07	Dao	007	B												
01 Feb	S09W68	019	0110	02	Cao	002	B												
02 Feb	S08W84	022	0090	03	Hax	001	A												
03 Feb	S10W97	022	0030	02	Axx	001	A												

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 019



Region Summary – continued.

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

Region 728

25 Jan	S14E66	338	0050	01	Hsx	001	A												
26 Jan	S14E53	338	0010	03	Bxo	002	B												
27 Jan	S14E36	341	0010	03	Bxo	002	B												
28 Jan	S14E24	340	0010	01	Axx	001	A												
29 Jan	S14E11	340	0000	00		000													
30 Jan	S13E01	337	0010	02	Hsx	002	A												
31 Jan	S11W12	336	0000	01	Axx	001	A												
01 Feb	S11W25	336																	
02 Feb	S11W38	336																	
03 Feb	S11W51	336																	
04 Feb	S11W64	336																	
05 Feb	S11W77	336																	
06 Feb	S11W90	336																	

Still on Disk.
Absolute heliographic longitude: 337

Region 729

31 Jan	S10E18	306	0070	05	Dsi	011	B												
01 Feb	S08E06	305	0060	06	Cso	005	B												
02 Feb	S10W10	308	0060	07	Dao	007	B												
03 Feb	S11W25	310	0020	01	Hsx	002	A												
04 Feb	S11W39	312	0020	01	Hsx	001	A												
05 Feb	S11W52	312	0010	01	Axx	001	A												
06 Feb	S11W66	312	0020	01	Hsx	001	A												

Still on Disk.
Absolute heliographic longitude: 305

Region 730

04 Feb	S20E73	200	0060	02	Hsx	001	A												
05 Feb	S20E60	200	0030	01	Hsx	001	A												
06 Feb	S20E46	200	0050	02	Hax	001	A												

Still on Disk.
Absolute heliographic longitude: 200

Region 731

06 Feb	S02E27	219	0030	03	Dso	002	B												
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Still on Disk.
Absolute heliographic longitude: 219



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 732

06 Feb	N09E70	176	0040	08	Dao	003	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 176

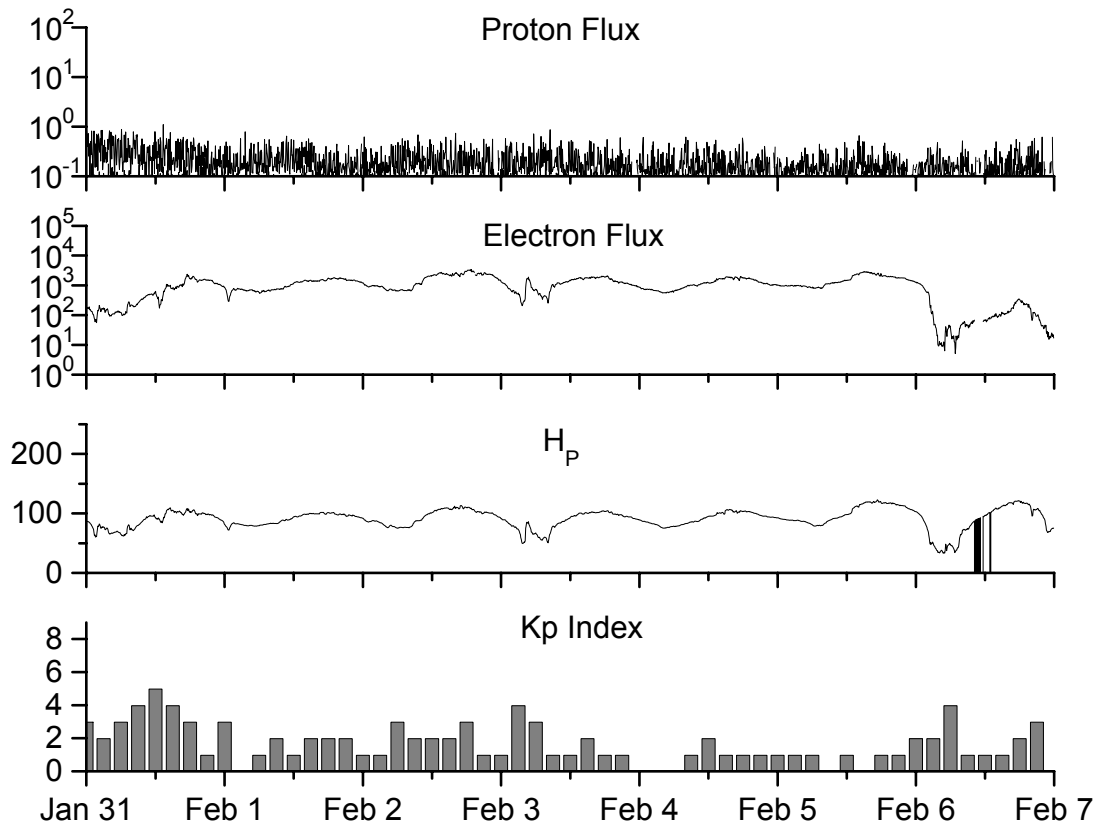


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values SWO	Ratio RI	Ratio RI/SWO	Smooth values SWO	Smooth values RI	*Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
2003									
February	87.0	46.0	0.53	136.4	78.5	124.5	144.7	17	18.9
March	119.7	61.1	0.51	128.1	74.2	132.2	139.5	21	19.4
April	119.7	60.0	0.50	121.5	70.3	126.3	135.0	20	20.1
May	89.6	55.2	0.62	118.3	67.8	129.3	133.1	26	21.0
June	118.4	77.4	0.65	113.6	65.2	129.4	130.2	24	21.5
July	132.8	85.0	0.64	106.9	62.0	127.8	127.2	19	22.0
August	114.3	72.7	0.64	102.8	60.3	122.1	125.2	23	22.2
September	82.6	48.8	0.59	100.7	59.8	112.3	123.7	18	21.8
October	118.9	65.5	0.55	96.6	58.4	153.1	121.8	35	21.1
November	118.9	67.3	0.57	93.6	57.0	153.1	120.1	28	20.0
December	75.4	46.5	0.62	91.4	55.0	115.1	118.0	16	18.6
2004									
January	62.3	37.7	0.61	87.9	52.0	114.1	116.3	22	18.1
February	75.6	45.8	0.61	84.2	49.4	107.0	115.5	13	17.7
March	81.0	49.1	0.61	80.9	47.2	112.2	114.6	14	16.9
April	59.3	39.3	0.66	77.9	45.6	101.2	112.3	11	15.5
May	77.3	41.5	0.54	74.1	43.9	99.8	109.2	8	14.3
June	78.9	43.2	0.55	70.4	41.7	97.4	107.2	8	14.0
July	87.8	51.0	0.58	68.3	40.2	118.5	105.9	23	13.8
August	69.5	40.9	0.59			110.1		11	
September	50.0	27.7	0.55			103.1		10	
October	77.9	48.4	0.62			105.7		9	
November	70.5	43.7	0.62			113.2		26	
December	34.7	17.9	0.52			94.6		11	
2005									
January	52.0	31.3	0.60			102.4		22	

NOTE: All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. *After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary
Week Beginning 31 January 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W108) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

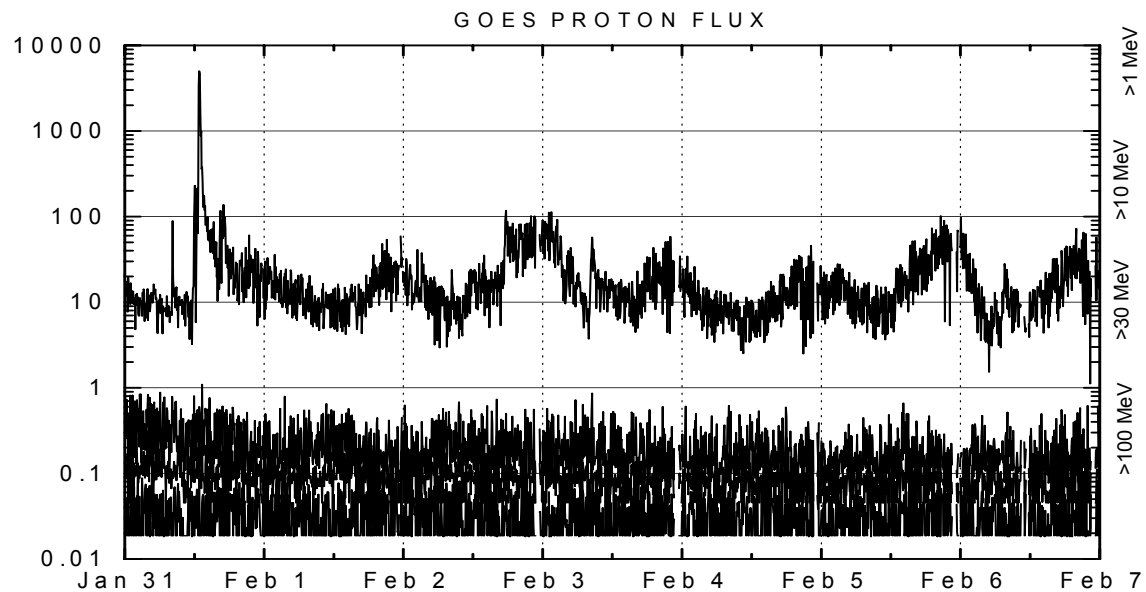
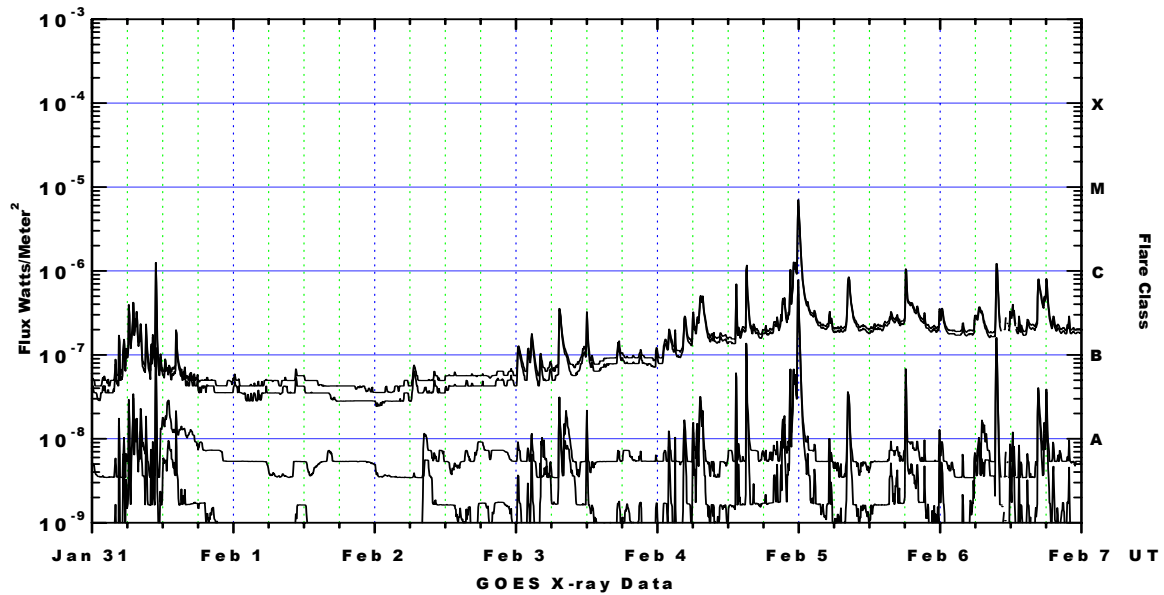
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

H_p plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

K_p plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final K_p values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SWO 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 K_p are "global" parameters that are applicable to a first order approximation over large areas. H_p 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

X-ray plot contains five-minute averaged x-ray flux (watts/m²) as measured by GOES 12 (W75) and GOES 10 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W108) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm²-sec-sr) at greater than 10 MeV.

