

Space Weather Highlights **03 - 09 January 2005**

SWO PRF 1532
11 January 2005

Solar activity was at very low to moderate levels. The summary period began with low levels on 03 – 04 January with C-class activity observed from Region 715 (N04, L=339, class/area, Dkc/350 on 30 December). A C7.3/Sf flare was observed from Region 715 at 04/1113 UTC with an associated faint halo CME. From 05 – 07 January, activity levels decayed to very low as Region 715 showed steady decay. Although very low, two events of note occurred on the 5th. The first was a prolonged B8.2 flare at 05/0522 UTC from Region 715. This event had an associated faint full halo CME. The second event was a large 30 degree filament eruption near N01E14. This solar event also resulted in a full halo CME with an impressive post-CME arcade on SXI and EIT imagery. Low levels returned by 08 January. By 09 January, activity levels increased to moderate as new Region 719 (S08, L=192, class/area, Cao/100 on 09 January) produced an M2.4/1n at 09/0851 UTC with an associated Type II (847 km/s). LASCO imagery indicated a CME with a non-Earthward directed component.

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 650 km/s due to a high speed stream from a geoeffective coronal hole. Solar wind speed remained elevated for the next couple of days ranging from 650 km/s to 800 km/s. Speed began to decline on 05 January at approximately 1600 UTC until 07/0800 UTC with the arrival of transient flow from CME activity on 04 and 05 January. By the end of the UTC day on 07 January, Bz had turned southward to -20nT. Solar wind speed increased to near 550 km/s during this time. On 09 January, transient flow had passed and wind speed decreased to approximately 450 km/s.

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

The greater than 2 MeV electron flux at geosynchronous orbit increased to high levels on 03 – 06 January.

The geomagnetic field ranged from quiet to major storm levels. Quiet to minor storm levels were experienced on 03 and 05 January, while quiet to active conditions were observed on 04 January. Elevated activity on these days was due to the effects of a geoeffective coronal hole high speed stream (HSS). Quiet to unsettled conditions were observed on 06 January as the effects of the HSS began to decrease. Quiet to major storm conditions were seen on 07 and 08 January due to the arrival of transient flow from CME activity on 04 and 05 January. Quiet to unsettled conditions were observed on 09 January.

Space Weather Outlook **12 January - 07 February 2005**

Solar activity is expected to be very low to low with a chance of isolated of M-class activity from Region 719.

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 14 - 15, 18 - 19, and 25 January to 02 February.

The geomagnetic field is expected to range from mostly quiet to active levels with isolated minor storm periods. Coronal hole high speed streams are expected to produce occasional storm periods on 24 – 26 and 29 - 31 January. 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
03 January	94	43	160	B1.4	3	0	0	1	0	0	0	0
04 January	88	30	40	A8.3	3	0	0	3	0	0	0	0
05 January	88	15	30	A5.0	0	0	0	0	0	0	0	0
06 January	83	14	30	A4.7	0	0	0	0	0	0	0	0
07 January	84	22	80	A6.5	0	0	0	0	0	0	0	0
08 January	89	34	170	A7.3	1	0	0	0	0	0	0	0
09 January	88	28	190	A9.5	1	1	0	1	2	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
	03 January	4.4E+6	1.3E+4	2.4E+3		1.6E+8
04 January	4.8E+6	1.1E+4	2.3E+3		5.3E+8	
05 January	3.8E+6	1.1E+4	2.1E+3		9.2E+8	
06 January	2.3E+6	1.1E+4	2.3E+3		9.1E+8	
07 January	4.1E+6	1.2E+4	2.4E+3		4.1E+8	
08 January	1.8E+6	1.1E+4	2.4E+3		4.3E+6	
09 January	1.3E+6	1.3E+4	2.8E+3		2.8E+6	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	03 January	14	3-3-2-3-4-3-2-2	44	3-3-6-6-6-5-4-2	22
04 January	16	4-4-2-3-3-3-2-3	41	3-3-4-5-6-6-5-3	23	4-4-3-4-4-4-3-3
05 January	11	4-3-2-3-2-2-1-1	26	3-2-5-6-4-3-3-1	21	5-4-5-4-3-3-1-2
06 January	4	1-0-0-0-2-1-3-1	18	1-4-0-3-4-4-3-4	4	2-0-0-0-0-1-3-1
07 January	21	0-0-0-1-4-4-4-6	70	4-5-0-4-8-7-4-5	37	1-0-0-1-6-6-4-7
08 January	20	5-5-3-3-3-2-2-2	34	6-5-3-6-4-1-2-3	30	6-6-3-4-3-3-2-2
09 January	3	1-1-0-3-0-1-1-0	3	1-2-0-1-0-0-2-0	4	1-1-0-3-1-1-1-1

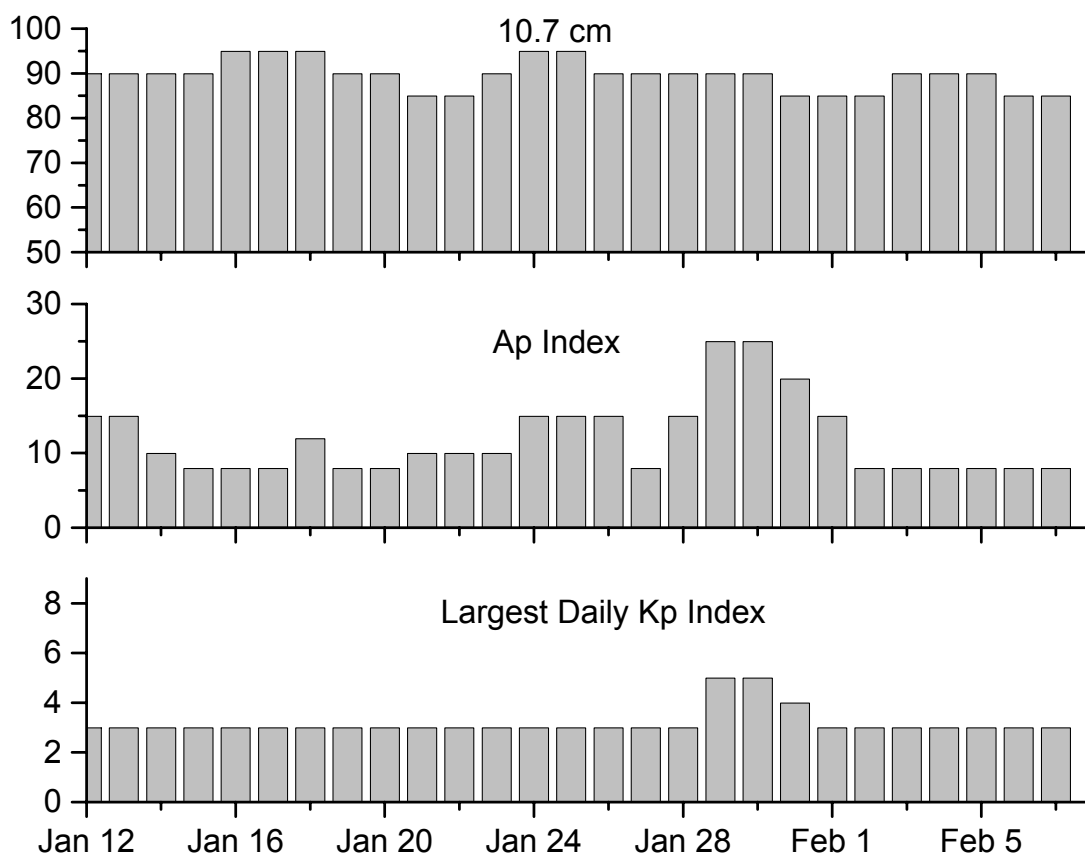


Alerts and Warnings Issued

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
03 Jan 1327	ALERT: Electron 2MeV Integral Flux > 1000pfu	03 Jan 1305
03 Jan 1549	EXTENDED WARNING: Geomagnetic K = 4	01 Jan 1817 - 03 Jan 2359
03 Jan 2255	EXTENDED WARNING: Geomagnetic K = 4	01 Jan 1817 - 04 Jan 1500
04 Jan 0514	ALERT: Electron 2MeV Integral Flux > 1000pfu	04 Jan 0500
04 Jan 1455	EXTENDED WARNING: Geomagnetic K = 4	01 Jan 1817 - 04 Jan 2359
04 Jan 2350	EXTENDED WARNING: Geomagnetic K = 4	01 Jan 1817 - 05 Jan 1600
05 Jan 0516	ALERT: Electron 2MeV Integral Flux > 1000pfu	05 Jan 0500
05 Jan 1555	EXTENDED WARNING: Geomagnetic K = 4	01 Jan 1817 - 06 Jan 1600
06 Jan 0515	ALERT: Electron 2MeV Integral Flux > 1000pfu	06 Jan 0500
07 Jan 0611	ALERT: Electron 2MeV Integral Flux > 1000pfu	07 Jan 0500
07 Jan 1440	WARNING: Geomagnetic K = 4	07 Jan 1440 - 08 Jan 1600
07 Jan 1444	ALERT: Geomagnetic K = 4	07 Jan 1445
07 Jan 1448	WARNING: Geomagnetic K = 5	07 Jan 1450 -2359
07 Jan 1450	ALERT: Geomagnetic K = 5	07 Jan 1451
07 Jan 1456	ALERT: Geomagnetic K = 6	07 Jan 1456
07 Jan 1640	ALERT: Geomagnetic K = 6	07 Jan 1637
07 Jan 2118	WARNING: Geomagnetic K = 6	07 Jan 2200 -08 Jan 0800
07 Jan 2134	WATCH: Geomagnetic A \geq 20	08 Jan
07 Jan 2253	ALERT: Geomagnetic K = 6	07 Jan 2252
07 Jan 2258	WARNING: Geomagnetic K = 7	07 Jan 2300 -08 Jan 0800
07 Jan 2305	ALERT: Geomagnetic K = 7	07 Jan 2301
08 Jan 1513	EXTENDED WARNING: Geomagnetic K = 4	07 Jan 1440 -08 Jan 2359
09 Jan 0954	ALERT: Type II Radio Emission	09 Jan 0854
09 Jan 1053	SUMMARY: Geomagnetic Sudden Impulse	09 Jan 1042



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
12 Jan	90	15	3	26 Jan	90	15	3
13	90	15	3	27	90	8	3
14	90	10	3	28	90	15	3
15	90	8	3	29	90	25	5
16	95	8	3	30	90	25	5
17	95	8	3	31	85	20	4
18	95	12	3	01 Feb	85	15	3
19	90	8	3	02	85	8	3
20	90	8	3	03	90	8	3
21	85	10	3	04	90	8	3
22	85	10	3	05	90	8	3
23	90	10	3	06	85	8	3
24	95	15	3	07	85	8	3
25	95	15	3				



Energetic Events

Date	Time		X-ray		Optical Information			Peak		Sweep Freq			
	Begin	Max	½	Max	Class	Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		Intensity	
										245	2695	II	IV
09 Jan 05	0825	0851	0909	M2.4	.033	1n	S09E69	719	35	77	1		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn	
	Begin	Max	End					
03 January	0150	0202	0218	B7.5			717	
	0408	0419	0457	C3.8	Sf	N03E07	715	
	0931	0939	0941	C1.1			717	
	1058	1109	1118	C1.1			717	
04 January	0038	0054	0115	B8.5				
	0150	0156	0204	C1.0	Sf	N03W03	715	
	0606	0614	0646	C3.3	Sf	N04W04	715	
	B1104	1114	1129	C7.3	Sf	N04W10	715	
05 January	0403	0522	0544	B8.2			715	
06 January	2233	2243	2256	B1.9				
07 January	0743	0749	0800	B1.2				
	1109	1115	1120	B1.9				
	1211	1216	1222	B1.9				
	1553	1558	1602	B2.0				
	1610	1615	1619	B2.4				
	1647	1655	1712	B2.9			719	
	1837	1846	1853	B6.8			719	
	2035	2041	2048	B2.3			719	
	08 January	0219	0225	0231	B2.7			719
		0622	0625	0630	B3.4			719
0706		0711	0716	B4.4			719	
0844		0850	0908	B3.1			719	
1049		1052	1054	B1.3				
1122		1129	1150	B1.3				
1329		1340	1351	B3.5			719	
09 January	1936	1957	2015	C1.0			719	
	B0540	0545	0547	B4.6	1f	S06E73	718	
	0828	0845	1017	M2.4	1n	S09E69	719	
	1452	1453	1458	C2.6	Sf	S09E68	719	



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 715

28 Dec	N04E74	339	0080	05	Dao	002	B	2			1								
29 Dec	N04E61	339	0260	08	Dko	003	Bgd		1		1								
30 Dec	N04E47	339	0350	05	Dkc	012	Bgd	6	2		4	1	1						
31 Dec	N04E34	339	0220	06	Dac	022	Bgd	3	1		4								
01 Jan	N05E21	339	0180	05	Dac	016	Bg	1		1									
02 Jan	N05E08	339	0130	07	Dsi	017	Bg	1											
03 Jan	N04W04	339	0130	09	Dai	016	Bg	1			1								
04 Jan	N05W19	340	0040	06	Dsi	009	B	3			3								
05 Jan	N04W33	341	0030	04	Dro	005	B												
06 Jan	N04W46	341	0030	04	Dso	004	B												
07 Jan	N06W59	341	0020	01	Hax	001	A												
08 Jan	N08W69	338	0020	01	Axx	001	A												
09 Jan	N08W82	338																	
								17	4	1	14	1	1	0	0				

Still on Disk.

Absolute heliographic longitude:339

Region 716

30 Dec	S16E52	334	0010	04	Bxo	002	B											
31 Dec	S14E37	336	0020	03	Cao	005	B											
01 Jan	S14E24	336	0020	01	Dso	001	B											
02 Jan	S13E11	336	0010	03	Cso	002	B											
03 Jan	S13W01	336	0030	05	Cao	007	B											
04 Jan	S13W16	337	0000	00	Axx	001	A											
05 Jan	S13W29	337																
06 Jan	S13W42	337																
								0	0	0	0	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude:336

Region 718

07 Jan	S09E78	204	0060	02	Hax	001	A											
08 Jan	S08E67	202	0090	03	Cao	002	B											
09 Jan	S08E54	202	0090	03	Dao	003	B				1							
								0	0	0	0	1	0	0	0			

Still on Disk.

Absolute heliographic longitude:202



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	4							
<i>Region 719</i>																						
08 Jan	S09E82	187	0060	02	Hax	001	A	1														
09 Jan	S08E64	192	0100	04	Cao	005	B	1	1			1	1									
								2	1	0	1	1	0	0	0	0						
Still on Disk.																						
Absolute heliographic longitude:192																						

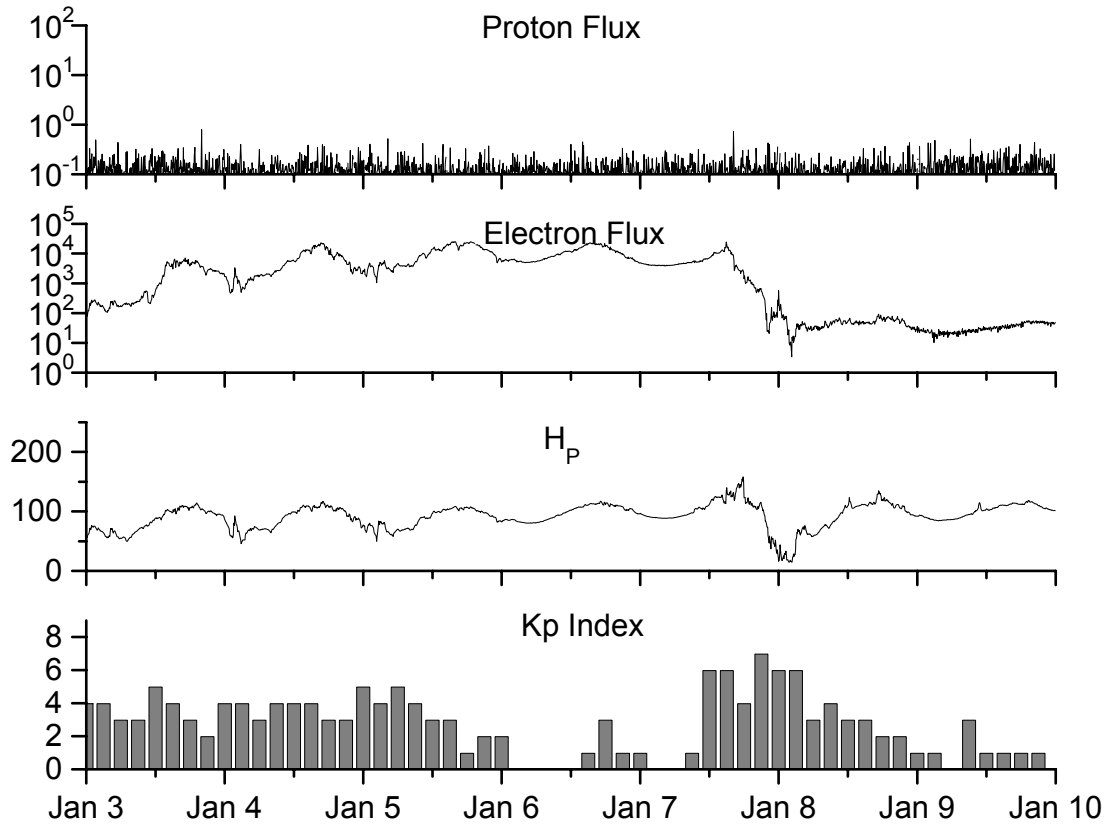


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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									
January	149.3	79.7	0.53	141.7	81.0	144.0	149.2	13	18.2
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			118.5		23	
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	

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 03 January 2005*

Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec-sr) as measured by GOES-11 (W107) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

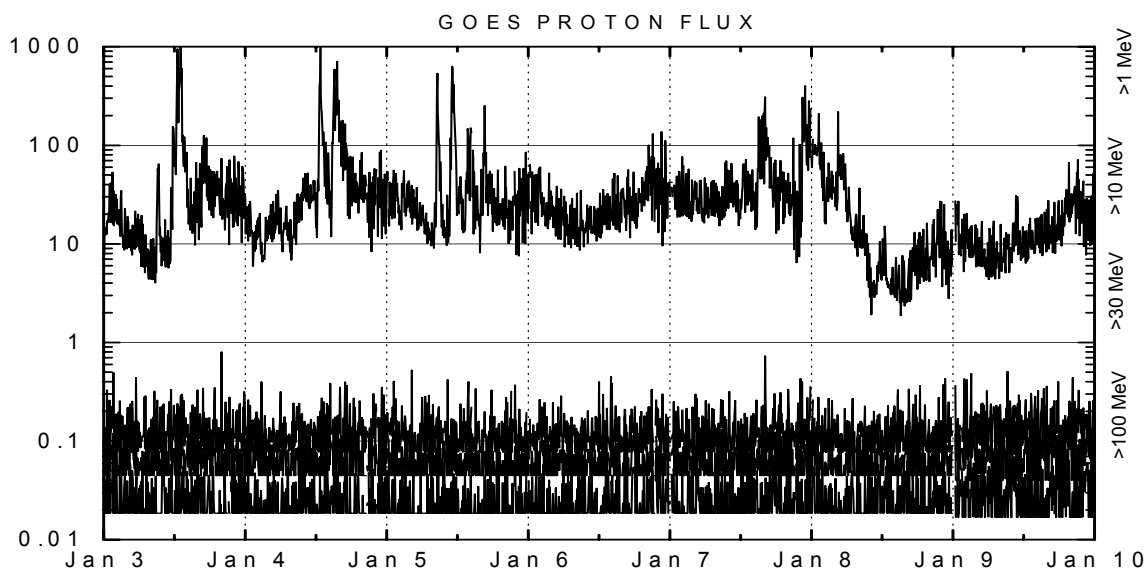
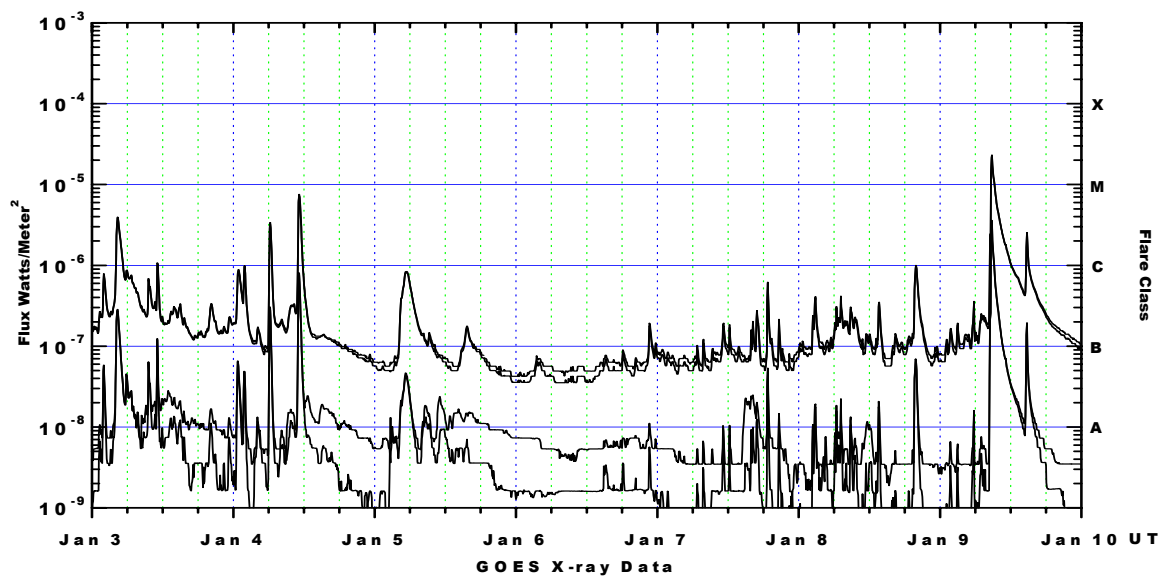
Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec-sr) with energies greater than 2 MeV at GOES-12 (W75).

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 (W107) 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.





Space
Environment
Center

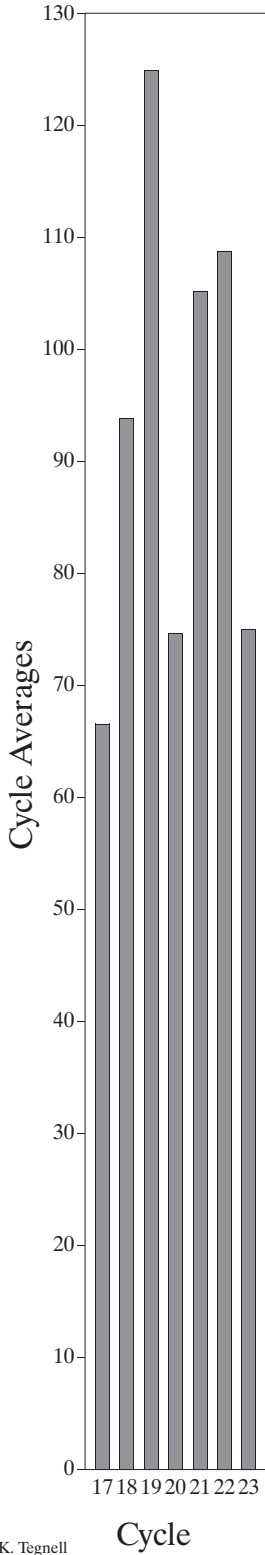
Sunspot Number (RI)

December 2004
(Month 99)

Preliminary data



Comparison of Cycles
at current month in cycle



K. Tegnell

