

Space Weather Highlights

01 September 1997 - 07 September 1997

Solar activity ranged from very low to moderate. Region 8076 (N29, L = 106, class/area Esi/280 on 29 August) produced an M1/SF flare at 02/1230UT. Remaining flare activity consisted of C-class subflares.

Solar wind data were received from the WIND spacecraft a few hours per day (data for 07 September were unreliable due to spacecraft position). Velocities ranged from 400 - 300 km/sec through 02 September, then increased to 570 km/sec by early 04 September. Velocities gradually decreased for the rest of the period. Particle densities ranged 06 - 14 p/cc through 02 September, then varied 07 - 40 p/cc during 03 - early 04 September. Densities dropped to a range of 03 - 10 p/cc for the balance of the period. Bz varied from minus 17 to plus 15 nT (GSM) during 03 - 04 September, but hovered around zero (plus to minus 05 nT) during the remaining days. Solar sector orientation was not readily discernible.

There were no significant proton enhancements observed at satellite altitudes.

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

The geomagnetic field was quiet at all latitudes through 02 September. Activity increased during 03 - 04 September with active to minor storm conditions at all latitudes and isolated major storm levels at high latitudes. Activity declined to quiet to unsettled levels after 04/1200UT. The disturbance was likely associated with the semi-halo CME observed on 29 August.

Space Weather Forecast

10 September 1997 -06 October 1997

Solar activity is expected to range from low to moderate. Isolated M-class flare activity is expected through most of the forecast period.

No significant proton enhancements are expected at satellite altitudes.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be normal to moderate during most of the period. However, high fluxes may occur during 11 - 12 and 26 - 28 September.

The geomagnetic field is expected to be predominately quiet to unsettled. However, increased activity is expected during 10 September, and again during 24 - 25 September due to a recurrent high speed coronal hole wind stream.



Daily Solar Data

Date	Radio Flux	Sun spot	Sunspot Area	X-ray Background	X-ray Flux			Flares				
	10.7 cm	No. (10 ⁶ hemi.)			C	M	X	S	1	2	3	4
01 September	93	90	240	B2.3	2	0	0	1	0	0	0	0
02 September	92	67	240	B1.4	3	1	0	6	1	0	0	0
03 September	93	55	250	B2.8	4	0	0	7	1	0	0	0
04 September	93	56	320	B1.7	0	0	0	4	0	0	0	0
05 September	96	79	400	B2.0	1	0	0	5	0	0	0	0
06 September	98	85	410	B2.3	1	0	0	2	0	0	0	0
07 September	102	84	640	B4.7	3	0	0	12	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
01 September	5.1E+5	1.8E+4	4.3E+3		3.5E+7	
02 September	5.7E+5	1.8E+4	4.1E+3		2.8E+7	
03 September	6.1E+5	1.8E+4	4.2E+3		5.5E+6	
04 September	6.0E+5	1.7E+4	3.8E+3		5.4E+5	
05 September	3.7E+5	1.7E+4	4.0E+3		1.7E+6	
06 September	3.6E+5	1.7E+4	4.1E+3		5.4E+6	
07 September	4.2E+5	1.8E+4	4.1E+3		1.1E+7	

Daily Geomagnetic Data

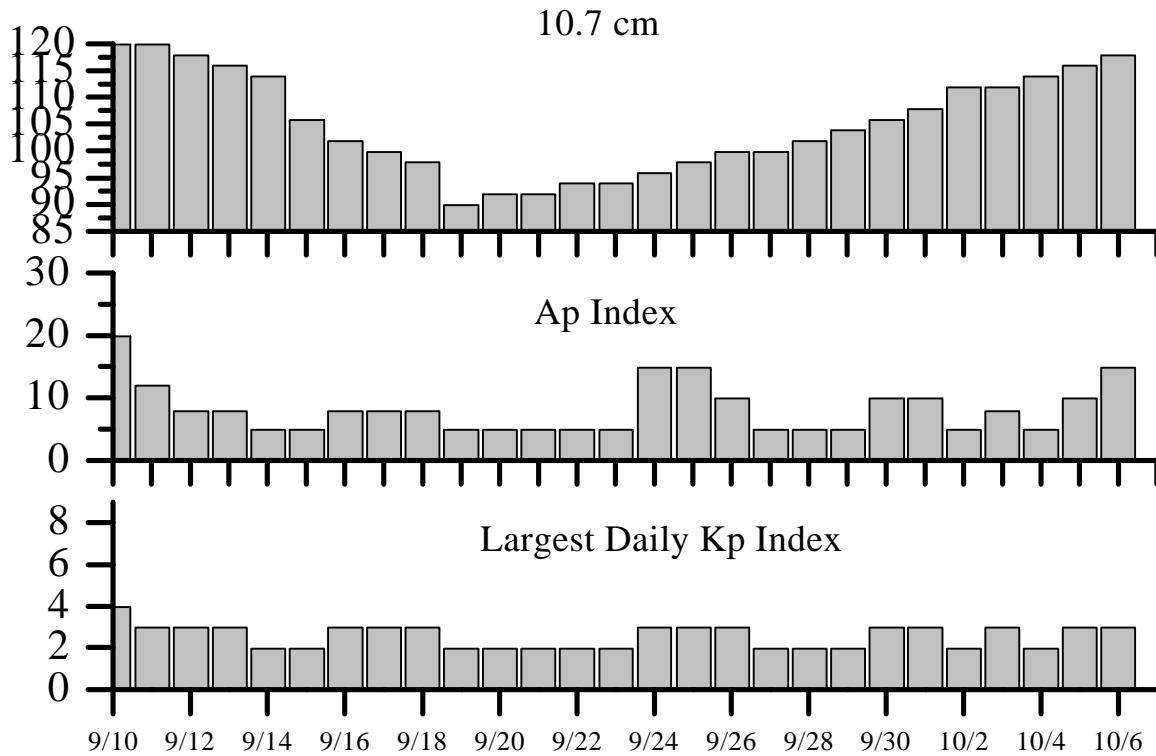
Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
01 September	6	2-2-2-2-1-1-1-2	0	0-0-0-1-0-0-0-0	4	2-2-2-1-1-1-1-1
02 September	5	2-2-1-1-1-0-1-3	*	0-0-*-0-0-0-0-1	5	1-2-0-0-1-2-2-3
03 September	18	3-2-3-3-3-3-3-5	12	1-0-4-1-4-1-2-4	19	3-2-3-3-3-3-4-5
04 September	18	5-4-4-2-2-2-3-2	12	4-3-4-4-0-1-0-1	19	5-4-4-3-3-3-3-2
05 September	6	1-2-1-1-2-2-2-2	*	1-0-0-*-0-2-0-0	5	1-1-1-1-2-2-2-2
06 September	8	1-3-2-2-3-2-2-1	4	1-2-0-3-2-0-0-0	7	1-3-1-3-3-1-1-1
07 September	4	0-1-1-1-2-2-1-1	1	0-0-0-2-1-0-0-0	3	0-0-0-1-2-1-1-1



Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
01 Sep 0010	>2MeV Electron Event in Progress ≥ 1000 pfu	31 Aug 2359
01 Sep 0015	1-245MHz Radio Burst	31 Aug
03 Sep 0032	1-245MHz Radio Burst	02 Sep
03 Sep 2130	A ≥ 20 Watch	04 Sep
04 Sep 0000	K = 5 observed	03 Sep 21-24
04 Sep 0003	1-245MHz Radio Burst	03 Sep
04 Sep 0014	2695MHz Radio Burst	03 Sep 0006
04 Sep 0309	A ≥ 20 observed	04 Sep 0308
05 Sep 0004	245MHz Radio Noise Storm	04 Sep 0059
05 Sep 0006	1-245MHz Radio Burst	04 Sep
07 Sep 0034	2-245MHz Radio Burst	06 Sep
07 Sep 0041	245MHz Radio Noise Storm	06 Sep 0905





Twenty-seven Day Outlook

Date	Radio Flux			Planetary			Largest		
	10.7 cm	10.7 cm	10.7 cm	A Index	A Index	A Index	Kp Index	Kp Index	Kp Index
10 Sep	120	120	120	20	12	8	4	3	3
11	120	118	116	12	8	8	3	3	3
12	118	116	114	8	8	5	3	3	2
13	116	114	106	8	5	5	3	3	2
14	114	106	102	5	5	8	2	3	3
15	106	102	100	5	5	8	2	3	3
16	102	100	98	5	5	8	2	3	2
17	100	98	90	5	5	8	2	3	3
18	98	90	92	5	5	5	2	2	2
19	90	92	92	5	5	5	2	2	2
20	92	94	94	5	5	5	2	2	2
21	92	94	94	5	5	5	2	2	2
22	94	94	94	5	5	5	2	2	2
23	94	94	94	5	5	5	2	2	2



Energetic Event

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ Flux	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
02 Sep	1225	1230	1234	M1.0	.002	1N	N28W37		8076	32	13		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location		Rgn #
	Begin	Max	End			Lat	CMD	
01 September	0132	0139	0146	B3.9				
	0152	0201	0214	C2.2				
	0233	0238	0241	C1.1				
	0337	0340	0342	B2.9				
	0358	0358	0401	B2.9	SF	N24W14	8076	
	0436	0442	0446	B5.2				
	0920	0927	0933	B2.5				
	1607	1610	1616	B2.1				
02 September	2211	2214	2220	B2.6				
	0656	0658	0702	B3.8	SF	N29W35	8076	
	1142	1143	1147	B3.5	SF	N30W36	8076	
	1228	1229	1245	M1.0	1N	N28W37	8076	
	1529	1530	1536	B2.7	SF	N29W35	8076	
	B1638	U1638	A1649	C1.2	SF	N29W39	8076	
	2114	2115	2121	C4.1	SF	N24W36	8076	
03 September	2358	2358	0009	C2.8	SF	N32W41	8076	
	0208	0210	0222	C2.7	1F	N32W43	8076	
	0332	0336	0340	B7.2				
	0531	0537	0553	C1.7				
	0641	0641	0651	C1.0	SF	N30W46	8076	
	0900	0903	0911		SF	N28W43	8076	
	1406	1407	1417		SF	S27E58		
	1511	1519	1543	C1.1	SF	N28W48	8076	
	B1608	U1615	A1626		SF	S27E57	8083	
	1712	1713	1716		SF	S27E57	8083	
	1942	1957	2000	B3.7				
04 September	2225	2241	2253	B7.4				
	B2326	2332	2335		SF	S26E57	8083	
	1233	1233	1240		SF	N28W60	8076	
	1854	1857	1859		SF	S27E45	8083	
	1900	1903	1920		SF	S27E43	8083	
	2122	2127	2135	B7.4				
	2315	2315	2324	B2.8	SF	S28E43	8083	



Flare List – continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD#	
05 September	0001	0008	0024		SF	N23E36	8082
	1055	1102	1116	B3.0			
	1214	1224	1233	B7.3			
	1324	1325	1333	C1.7	SF	N28W74	8076
	1552	1552	1556		SF	N20E27	8082
	1559	1600	1604		SF	N21E27	8082
	1748	1751	1754	B3.2			
	1925	1932	1950	B8.4	SF	N21E23	8082
06 September	0123	0128	0132	B7.0			
	1118	1118	1125	B4.2	SF	N21E16	8082
	1736	1736	1740		SF	S26E86	
	2032	2035	2038	B3.8			
07 September	2046	2052	2054	C1.1			
	0300	0317	0349	C1.6			
	0445	0449	0454	C1.4			
	0614	0615	0619	C3.1	SF	S31E77	8085
	0738	0740	0747		SF	S24E75	8085
	0945	0947	0951		SF	S24E73	8085
	1336	1337	1356		SF	N21E00	8082
	1446	1447	1459		SF	S25E68	8085
	1551	1551	1554		SF	S24E68	8085
	1642	1644	1648		SF	S24E67	8085
	1709	1712	1716		SF	S24E67	8085
	1739	1741	1750		SF	S24E66	8085
	1900	1901	1905		SF	S24E66	8085
1916	1918	1921		SF	S26E05	8083	
1920	1921	1928		SF	S24E66	8085	



Region Summary

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 8076</i>																	
25 Aug	N29E63	107	0080	05	CRO	009	B	2			2						
26 Aug	N30E51	106	0160	07	DAI	009	B	2			4						
27 Aug	N29E37	107	0100	08	CSO	011	B										
28 Aug	N29E24	107	0200	10	DSI	025	BG				3						
29 Aug	N28E11	107	0280	13	ESI	032	BG	1			5						
30 Aug	N28W01	105	0200	15	ESI	029	BG	1			3						
31 Aug	N29W15	106	0210	15	ESI	032	B	3			8						
01 Sep	N28W28	106	0210	18	FSI	028	BG				1						
02 Sep	N28W42	107	0210	16	FSI	020	B	3	1		6	1					
03 Sep	N28W55	107	0160	15	ESI	017	B	3			3	1					
04 Sep	N27W65	103	0110	13	ESO	006	B				1						
05 Sep	N26W84	109	0050	02	HSX	001	A	1			1						
06 Sep	N25W91	103	0000	00	AXX	001	A										
								16	1	0	37	2	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 105

<i>Region 8077</i>																	
25 Aug	S23E59	111	0010	03	BXO	003	B										
26 Aug	S22E45	112	0000	00	AXX	001	A										
27 Aug	S22E32	112									1						
28 Aug	S22E19	112															
29 Aug	S22E06	112															
30 Aug	S22W07	112															
31 Aug	S22W20	112															
01 Sep	S22W33	112															
02 Sep	S22W46	112															
03 Sep	S22W59	112															
								0	0	0	1	0	0	0	0	0	

Died on Disk.

Absolute heliographic longitude: 112



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

Region 8078

27 Aug	N17E26	118	0010	01	AXX	002	A										
28 Aug	N16E12	119	0010	02	AXX	003	A										
29 Aug	N21E05	113	0000	00	AXX	002	A										
30 Aug	N20W05	109	0010	03	BXO	005	B										
31 Aug	N21W20	111	0010	03	BXO	004	B										
01 Sep	N21W33	111	0010	02	AXX	008	A										
02 Sep	N21W46	111	0010	02	AXX	003	A										
03 Sep	N21W59	111															
04 Sep	N21W72	111															
05 Sep	N21W85	111															
																	0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 113

Region 8079

28 Aug	N15E10	121	0010	02	AXX	003	A										
29 Aug	N15W03	121	0000	02	AXX	003	A										
30 Aug	N15W16	121															
31 Aug	N15W29	121															
01 Sep	N15W42	121															
02 Sep	N15W55	121															
03 Sep	N15W68	121															
04 Sep	N15W81	121															
																	0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 121

Region 8080

30 Aug	N18W31	135	0010	04	BXO	005	B										
31 Aug	N18W43	134	0000	01	AXX	003	A										
01 Sep	N18W56	134	0000	00	AXX	001	A										
																	0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 135



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 8081</i>																		
31 Aug	N34E72	019	0020	01	HRX	001	A											
01 Sep	N34E61	017	0020	01	HSX	002	A											
02 Sep	N34E50	015	0020	01	HRX	003	A											
03 Sep	N34E37	015	0020	02	AXX	004	A											
04 Sep	N33E26	012	0010	01	AXX	002	A											
05 Sep	N33E17	008	0010	03	BXO	004	B											
06 Sep	N30E06	006	0010	00	AXX	001	A											
07 Sep	N34W13	012	0000	00	AXX	001	A											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 006

<i>Region 8082</i>																		
01 Sep	N22E70	008	0000	00	AXX	001	A											
02 Sep	N21E58	007	0000	00	AXX	001	A											
03 Sep	N21E45	007																
04 Sep	N22E36	002	0000	00	AXX	001	A											
05 Sep	N21E22	003	0030	05	BXO	011	B							4				
06 Sep	N21E09	003	0050	06	CSO	010	B							1				
07 Sep	N21W04	003	0040	08	DSO	010	B							1				
										0	0	0	6	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 003

<i>Region 8083</i>																		
03 Sep	S28E55	357	0070	04	CRO	004	B							3				
04 Sep	S27E41	357	0200	05	DSO	007	B							3				
05 Sep	S27E28	357	0300	09	DKO	011	B											
06 Sep	S27E15	357	0300	09	DAO	011	B											
07 Sep	S28E04	355	0360	10	DAI	014	B							1				
										0	0	0	7	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 355

<i>Region 8084</i>																		
05 Sep	N22E64	321	0010	03	BXO	002	B											
06 Sep	N22E51	321	0010	00	HRX	001	A											
07 Sep	N21E36	323	0010	02	HRX	003	A											
										0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 323



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	
<i>Region 8085</i>															
06 Sep	S24E75	297	0040	01	HSX	001	A								
07 Sep	S25E64	295	0230	11	EAO	006	B	1			10				
								1	0	0	10	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 295



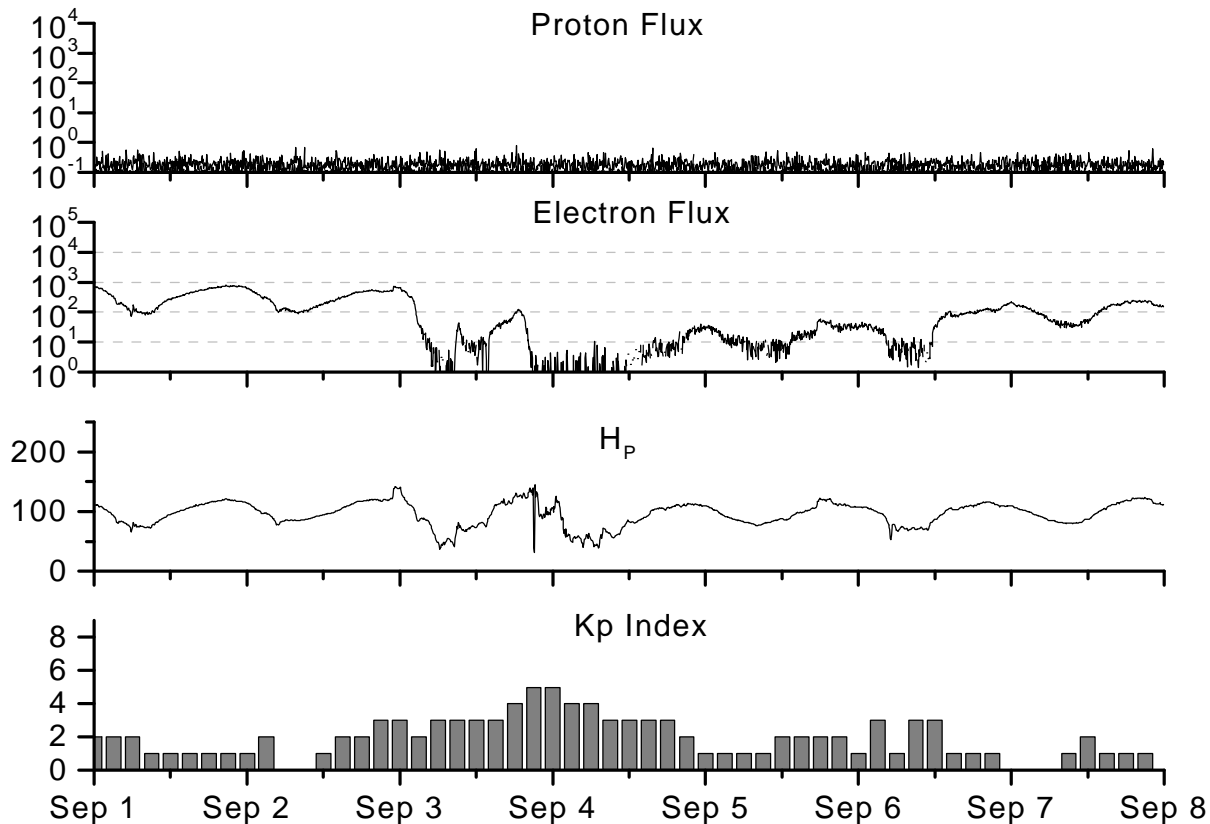
**Recent Solar Indices (preliminary)
of the observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
1995									
September	16.5	11.8	0.72	22.0	13.4	72.0	74.8	13	11.8
October	31.6	21.1	0.67	19.7	12.1	77.9	73.8	16	11.4
November	15.7	09.0	0.57	18.5	11.4	74.2	73.2	09	10.7
December	16.2	10.0	0.62	17.6	10.8	72.6	72.8	09	10.0
1996									
January	17.6	11.5	0.55	16.8	10.4	74.5	72.4	09	09.8
February	09.1	04.4	0.48	16.2	10.1	71.5	72.2	10	09.8
March	12.1	09.2	0.76	15.4	09.7	72.7	72.1	11	09.9
April	08.5	04.8	0.60	13.6	08.5	69.3	71.6	11	09.7
May	11.8	05.5	0.47	12.9	08.0	72.1	71.4	07	09.5
June	18.8	11.8	0.63	13.5	08.5	69.6	71.8	05	09.4
July	13.2	08.2	0.67	13.4	08.4*	71.2	72.0	07	09.3
August	20.5	14.4	0.68	13.1	08.3*	72.4	72.1	09	09.4
September	02.9	01.6	0.62	13.3	08.5*	69.4	72.3	15	09.3
October	02.3	00.9	0.78	14.0	08.9*	69.2	72.6	13	09.1
November	26.7	17.9	0.72	15.4	09.9*	78.7	73.0	08	09.1
December	21.1	13.3	0.60	16.2	10.5*	77.8	73.3	07	09.3
1997									
January	09.0	06.5*	0.72*	16.5	10.6*	74.0	73.4*	09	09.3*
February	11.3	07.6*	0.67*	17.4	11.2*	73.8	73.6*	11	09.2*
March	14.4	08.8*	0.61*			73.5		08	
April	24.5	15.8*	0.64*			74.5		10	
May	28.6	18.5*	0.64*			74.6		08	
June	22.1	13.1*	0.59*			71.7		07	
July	17.0	10.5*	0.62*			71.1*		06*	
August	36.7	24.7*	0.67*			76.8*		08*	

*Preliminary estimates.

The lowest smoothed sunspot indices number for Cycle 21, RI = 12.3, occurred September 1986. The highest smoothed sunspot number for Cycle 22, RI=158.5, occurred July 1989. ** From June 1991 onward, 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 01 September 1997

Protons plot contains the five minute averaged integral proton flux (protons/ cm^2 -sec-sr) as measured by GOES-9 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

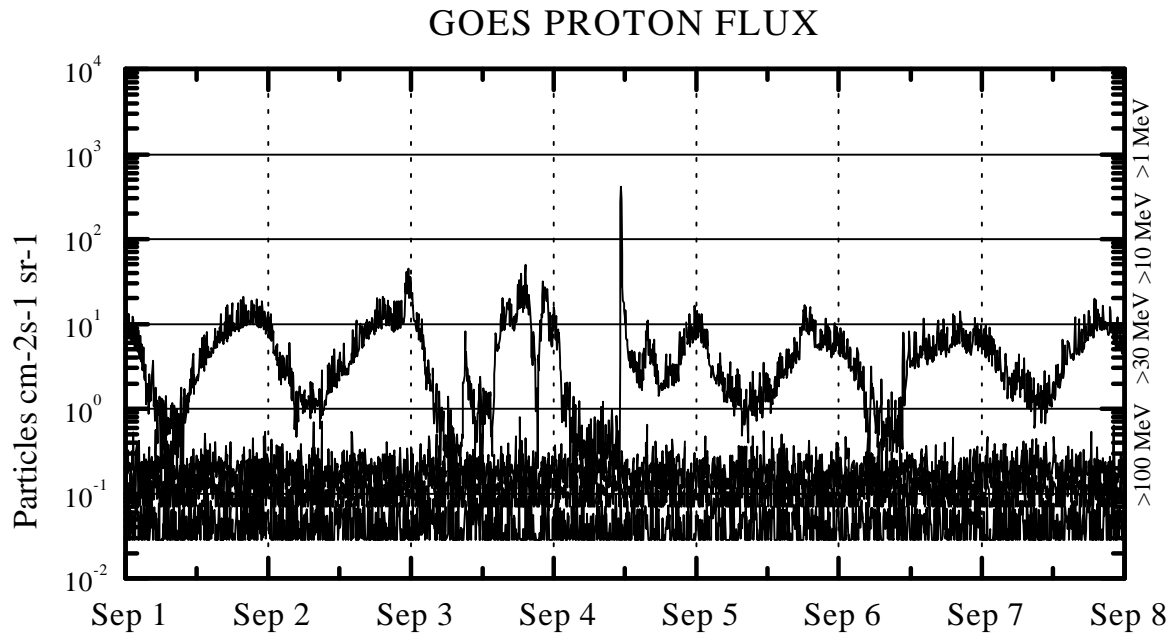
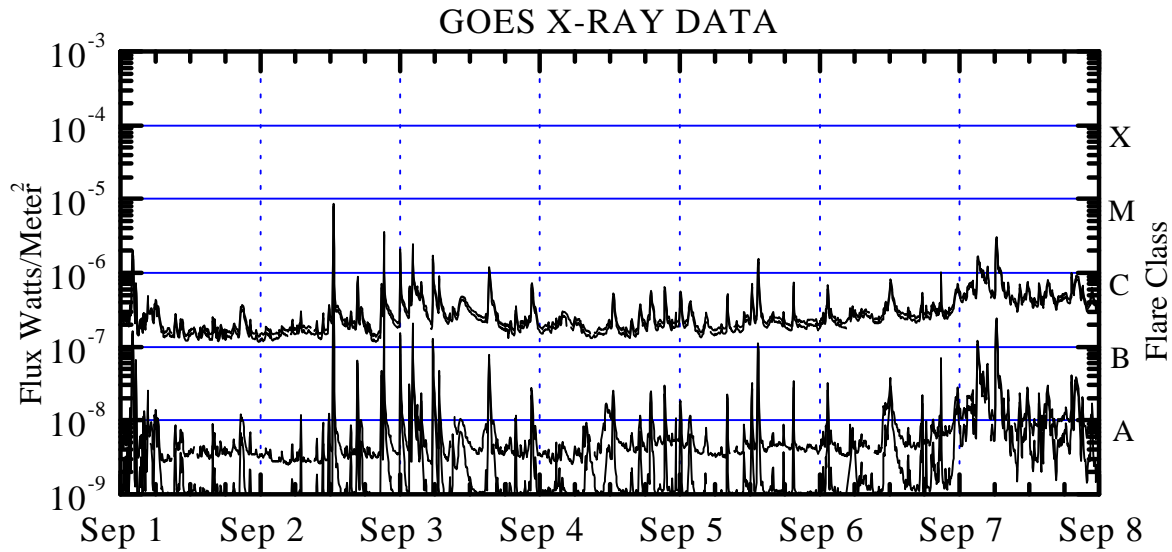
Electrons plot contains the five minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

H_p plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-9. 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 USAF 55th Space Weather Squadron) 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. These data are made available through cooperation from the Geological Survey of Canada (GSC) 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_{parallel} is subject to a more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





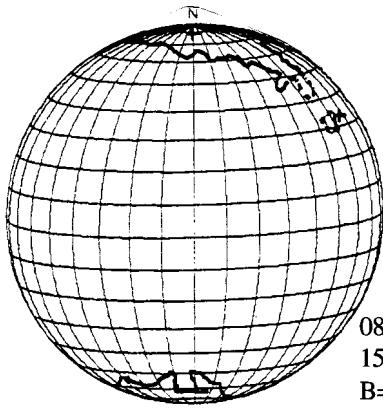
Weekly GOES Satellite X-ray and Proton Plots

Proton plot contains the five minute averaged integral proton flux (protons/ $\text{cm}^2\text{-sec-sr}$) as measured by GOES-9 (W135) for each of the energy thresholds: >1 , >10 , >30 and >100 MeV. P10 event threshold is 10 pfu (protons/ $\text{cm}^2\text{-sec-sr}$) at greater than 10 MeV.

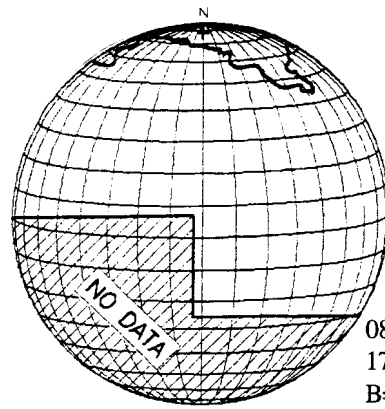
X-ray plot contains five minute averaged x-ray flux (watts/m^2) as measured by GOES 8 and 9 in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

NOTE: There is a bad data point in the Proton Plot above on 04 Sept at about 2120UT.

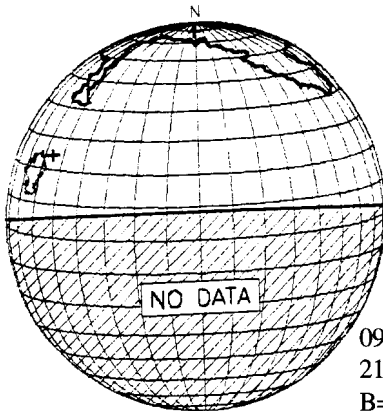




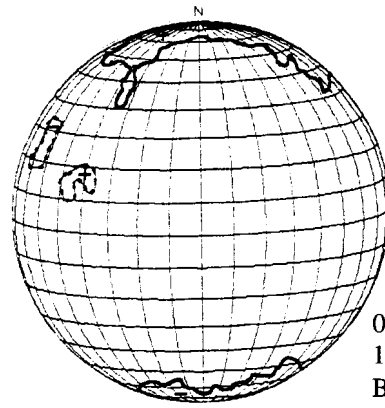
08/28/97
1545UT
B=+7°



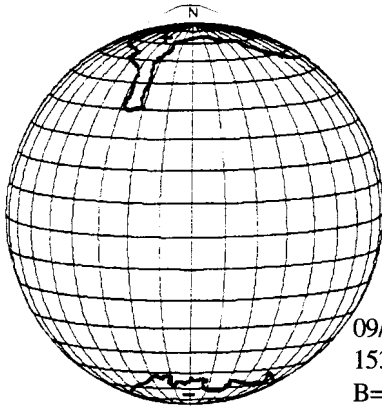
08/31/97
1736UT
B=+7°



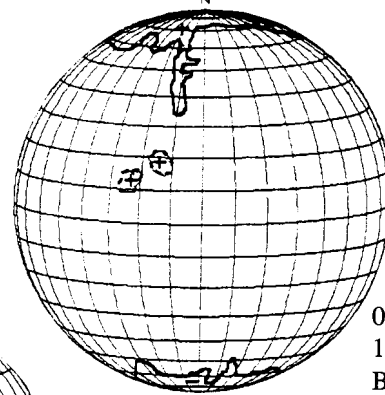
09/01/97
2114UT
B=+7°



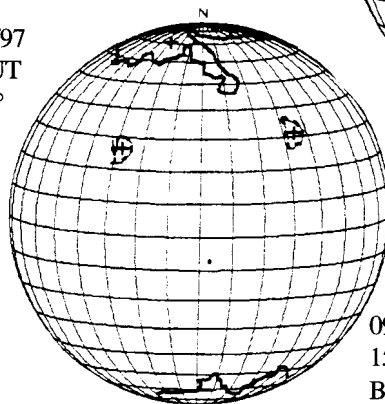
09/03/97
1644UT
B=+7°



09/04/97
1530UT
B=+7°



09/05/97
1655UT
B=+7°



09/07/97
1545UT
B=+7°

No Data
08/25-08/27, 08/29, 08/30
09/02, 09/06, 09/07

Coronal hole maps from the National Solar Observatory, Kitt Peak, Arizona

These maps are reproductions of the coronal hole contours as derived from the Kitt Peak 1083 nm raw data images. These are preliminary data, where solid (and dashed) lines are used to indicate more (and less) confidence in an inference and are printed whenever they are available at SWO.

