Space Weather Highlights
07-13 December 1998

Solar activity was low throughout the period. C-class flares occurred each day, none of which had significant radio emission. Regions 8408 (S18, L = 034, class/area Dao/190 on 13 December) and 8409 (S29, L = 021, class/area Eao/210 on 11 December) showed gradual growth beginning 11 December. Both regions produced C-class flares and had become moderate in size and magnetic complexity by the end of the period.

Solar wind data were available from the Advanced Composition Explorer (ACE) spacecraft during most of the period. Significant changes were observed in the solar wind flow on 11 December including a sector shift to toward conditions (phi angle near 315 degrees), southerly IMF Bz with maximum deflections to minus 13 nT (GSM), and enhanced densities. No significant velocity changes occurred during the period.

No significant proton flux enhancements were detected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude was at moderate to high levels through 10 December, then declined to normal to moderate levels for the rest of the period.

The geomagnetic field was quiet to unsettled during most of the period. However, field activity increased on 11 December with active to minor storm levels at middle latitudes and active to major storm levels at high latitudes.

Space Weather Forecast
16 December -11 January 1999

Solar activity is expected to be low during most of the period with C-class flares expected daily. There is also a chance for isolated M-class flares sometime during the period.

No significant proton enhancements are expected at geosynchronous altitude.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at normal to moderate levels during most of the period.

The geomagnetic field is expected to be at quiet to unsettled levels throughout the period, barring any Earth-directed CMEs.

Daily Solar Data

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background	Flares: X-ray Flux C	M	X	Flares: Optical S	1	2	3	4
07 December	153	143	950	B5.3	5	0	0	9	0	0	0	0
08 December	162	158	980	B5.3	7	0	0	11	1	0	0	0
09 December	154	132	870	B8.3	12	0	0	10	1	0	0	0
10 December	134	145	800	B6.8	2	0	0	7	0	0	0	0
11 December	143	166	1040	B4.9	5	0	0	14	0	0	0	0
12 December	147	142	740	B6.0	7	0	0	18	1	0	0	0
13 December	144	152	690	B5.6	9	0	0	12	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm^2-day-sr) >1MeV	>10MeV	>100MeV	Electron Fluence (electrons/cm^2-day-sr) >.6MeV	>2MeV	>4MeV
07 December	2.9E+5	1.4E+4	3.3E+3		1.6E+8	
08 December	1.3E+5	1.5E+4	3.2E+3		1.0E+8	
09 December	1.1E+5	1.4E+4	3.4E+3		9.1E+7	
10 December	1.3E+5	1.5E+4	3.6E+3		4.3E+7	
11 December	5.5E+5	1.5E+4	3.7E+3		2.2E+6	
12 December	7.2E+4	1.5E+4	3.5E+3		5.1E+6	
13 December	1.5E+5	1.4E+4	3.1E+3		1.8E+7	

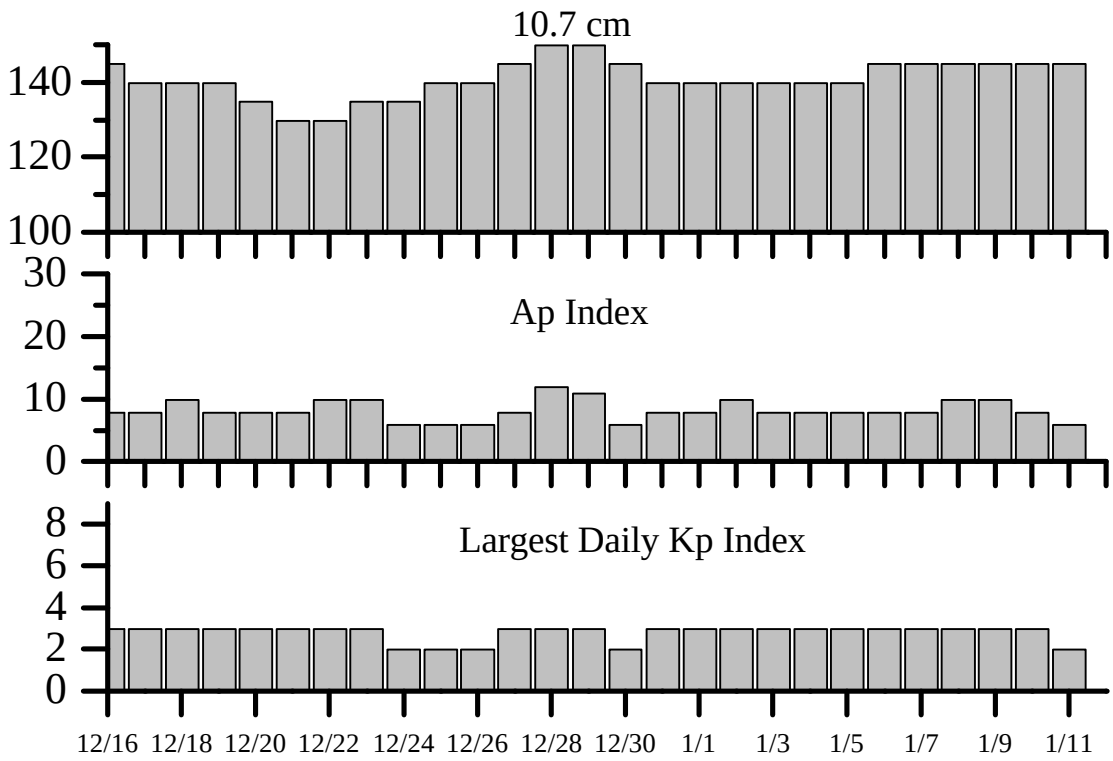
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg A	K-indices	High Latitude College A	K-indices	Estimated Planetary A	K-indices
07 December	5	2-0-2-1-1-2-1-2	13	1-1-4-4-4-2-1-1	6	2-0-2-1-2-2-1-2
08 December	3	2-0-2-1-0-1-1-0	5	1-0-2-3-1-2-1-0	5	2-0-2-2-1-2-1-1
09 December	4	2-1-2-1-1-2-1-0	9	0-1-2-2-3-4-1-2	5	1-1-2-1-2-3-2-0
10 December	4	0-1-1-0-1-1-1-3	6	0-0-1-2-3-3-1-1	6	1-0-1-2-1-2-2-3
11 December	19	5-3-3-4-2-3-2-3	52	3-4-6-6-5-7-3-2	30	4-4-5-5-4-4-3-3
12 December	7	4-2-1-1-2-1-1-1	10	4-1-2-4-2-0-1-1	6	3-2-2-1-1-1-1-1
13 December	2	0-0-0-0-1-1-1-1	1	0-0-0-0-0-1-1-0	3	0-0-0-0-0-1-2-1

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
07 Dec 0023	1-245 MHz Burst	06 Dec
07 Dec 1200	>2MeV Electron Event ≥1000pfu CONTINUED	05 Dec 1515
07 Dec 1343	Stratwarm Alert Exists Monday	07 Dec
08 Dec 0009	2-245 MHz Bursts	07 Dec
08 Dec 1200	>2MeV Electron Event ≥1000pfu CONTINUED	05 Dec 1515
08 Dec 1218	Stratwarm Alert Exists Tuesday	08 Dec
09 Dec 1200	>2MeV Electron Event ≥1000pfu CONTINUED	05 Dec 1515
09 Dec 1239	Stratwarm Alert Exists Wednesday	09 Dec
10 Dec 0021	1-245 MHz Burst	09 Dec
10 Dec 1203	>2MeV Electron Event ≥1000pfu CONTINUED	05 Dec 1515
10 Dec 1323	Stratwarm Alert Exists Thursday	10 Dec
11 Dec 0300	K= 4 Observed	11 Dec 00 - 03
11 Dec 0902	K= 4 Observed	11 Dec 06 - 09
11 Dec 1200	>2MeV Electron Event ≥1000pfu CONTINUED	05 Dec 1515
11 Dec 1811	K= 4 Observed	11 Dec 15 - 18
11 Dec 2040	A ≥ 20 Observed	11 Dec 1800
12 Dec 1217	Stratwarm Alert Exists Saturday	12 Dec
13 Dec 1206	Stratwarm Alert Exists Sunday	13 Dec

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
16 Dec	145	8	3	30	145	6	2
17	140	8	3	31	140	8	3
18	140	10	3	01 Jan	140	8	3
19	140	8	3	02	140	10	3
20	135	8	3	03	140	8	3
21	130	8	3	04	140	8	3
22	130	10	3	05	140	8	3
23	135	10	3	06	145	8	3
24	135	6	2	07	145	8	3
25	140	6	2	08	145	10	3
26	140	6	2	09	145	10	3
27	145	8	3	10	145	8	3
28	150	12	3	11	145	6	2
29	150	11	3				

Energetic Events

Date	Time (UT) Begin	Max	½ Max	X-ray Class	Integ Flux	Optical Information Imp Brtns	Location Lat	CMD	Rgn #	Peak Radio Flux 245	2695	Sweep Freq Intensity II	IV
No Events Observed													

Flare List

Date	Time Begin	Max	End	X-ray Class.	Optical Imp / Brtns	Location Lat CMD	Rgn #
07 December	0400	0409	0434	C1.7	SF	N16W08	8402
	0616	0616	0620	B8.9	SF	S16E58	8405
	0855	0856	0901	B9.0	SF	N17W08	8402
	0902	0903	0907		SF	N17W08	8402
	0949	0950	0955	C1.3	SF	N17W09	8402
	0953	0956	1001		SF	S23W03	8404
	1434	1442	1506	C2.3			
	1537	1538	1543		SF	S16E55	8405
	1632	1634	1643	C1.9	SF	S13E53	8405
	2146	2150	2217	C3.9	SF	S15E51	8405
08 December	0751	0753	0758		SF	S21W21	8404
	0804	0805	0808		SF	S17E15	8407
	1122	1132	1137		SF	S15E38	8405
	1232	1233	1324	C2.9	SF	S25W18	8404
	B1403	U1403	A1431	C5.7	SF	S14E40	8405
	1613	1618	1631	C2.0			
	1632	1638	1645	C3.5			
	1808	1851	1924	C1.8	1F	S24W27	8404
	1931	1936	1940		SF	S23W23	8404
	1940	1944	1947		SF	S23W23	8404
	1940	1940	1956		SF	S14E38	8405
	2012	2012	2044	C3.1	SF	N27W75	8399
	2128	2144	2210	C1.8	SF	S14E37	8405
	2233	2236	2240		SF	N29W75	8395
09 December	0124	0126	0131	C1.9	SF	S14E38	8405
	0328	0330	0335		SF	N23W81	8395
	0416	0416	0419		SF	N28W77	8395
	0507	0508	0520	C1.2	SF	N17W34	8402
	0550	0554	0558	C1.4			
	0644	0655	0710	C1.2			
	0815	0816	0836	C1.6	SF	S14E30	8405
	1050	1056	1059		SF	N28W85	8399
	1114	1132	1140	C3.1			
	1147	1147	1150		SF	N33W82	8399
	1206	U1211	A1227	C2.1	SF	S15E29	8405
	1536	1546	1603	C1.8	SF	N19W40	8402

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
09 December	1737	1741	1843	C5.9	1N	S14E26	8405
	1801	1806	1810	C3.2			
	2055	2100	2107	C1.3			
	B2210	2217	2231	C1.1	SF	S19E40	8406
10 December	0318	0323	0329		SF	S16E25	8405
	0617	0621	0627	C1.2			
	0805	0815	0820	C1.4	SF	S19E34	8408
	0821	0824	0826		SF	S19E34	8408
	1550	1556	1600		SF	S23W45	8404
	1739	1742	1746		SF	S24W47	8404
	1906	1909	1930		SF	S15E14	8405
	2348	2349	2353	B9.3	SF	S22W51	8404
11 December	0324	0325	0330		SF	S34E40	8409
	0325	0326	0331	C1.3	SF	S23W54	8404
	0333	0334	0343		SF	S23W54	8404
	0429	0431	0448	C1.2	SF	S17E07	8405
	0542	0601	0614		SF	S22W55	8404
	0719	0721	0723		SF	S15E05	8405
	0912	0917	0935		SF	S15E04	8405
	0927	0927	0936		SF	S21E22	8408
	0955	0956	0958		SF	S19E19	8408
	B1147	U1148	A1203	C1.3	SF	S17E20	8408
	B1157	U1216	A1222		SF	S20E20	8408
	1653	1656	1706		SF	S19E16	8408
	1729	1752	1819	C3.4	SF	S19E17	8408
	2009	2010	2015	C1.1	SF	S29E29	8409
12 December	0205	0208	0216		SF	S20E13	8408
	0237	0239	0245		SF	S20E12	8408
	0246	0248	0255		SF	S20E12	8408
	0353	0409	0415		SF	S16W09	8405
	0418	0420	0425		SF	S26E20	8409
	0425	0429	0439	C1.1	SF	S20E12	8408
	0511	0513	0519	C1.0	SF	S28E21	8409
	0611	0616	0622		SF	S28E20	8409
	0626	0632	0636		SF	S27E20	8409
	0701	0703	0710		SF	S30E62	8411
	0737	0738	0743		SF	S26E19	8409
	0943	0943	0946		SF	S17E07	8408
	0947	0952	1004		SF	S17W12	8405
	B1250	U1250	A1254	C1.3	SF	S29E26	8409
	1459	1500	A1505		SF	S22W74	8404
	1603	1603	1613		SF	S18E04	8408

Flare List-continued

Date	Time Begin	Time Max	Time End	X-ray Class.	Optical Imp / Brtns	Optical Location Lat CMD	Rgn #
12 December	1920	1922	1927	C1.3	SF	S20W69	8404
	2108	2112	2114	C2.5			
	2312	2312	2319	C1.6	SF	S22W73	8404
	2325	2327	2341	C3.0	1F	S16W18	8405
13 December	0149	0150	0153		SF	S18E01	8408
	0153	0156	0159	C2.7	SF	S21W80	8404
	0155	0200	0206		SF	S28E16	8409
	0323	0331	0337	C1.8			
	0432	0436	0450	C1.4	SF	S16W04	8408
	0512	0516	0518	C3.0			
	0711	0711	0719	C5.5	SF	S22W85	8404
	0946	0946	0950		SF	S29E49	8411
	1032	1034	1057	C3.7	SF	S19W04	8408
	1245	1246	1256		SF	S19W06	8408
	1354	1358	1402		SF	S19W06	8408
	B1532	U1532	A1556		SF	S16W10	8408
	1817	1821	1828		SF	S16W12	8408
	1845	1855	1908	C1.2			
	2018	2022	2025	C1.2			
	2042	2049	2103	C2.8	SF	S18W10	8408

Region Summary

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
		Region 8395													
24 Nov	N17E77	196	0040	03	HSX	001	A	1				1			
25 Nov	N17E68	192	0330	18	FAO	009	B	2			3				
26 Nov	N17E56	191	0360	25	FKO	019	BG	2			3	1			
27 Nov	N19E44	190	0470	29	FAI	018	BG	2			3				
28 Nov	N20E33	187	0480	30	FAO	026	BG			1	4			1	
29 Nov	N22E21	186	0440	37	FAO	044	BG	1			4				
30 Nov	N22E11	183	0350	31	FAI	055	BG	1			4				
01 Dec	N20W01	182	0340	17	FAI	029	BG	4			3	1			
02 Dec	N20W17	185	0200	15	EAO	022	BG	1			5				
03 Dec	N18W27	182	0200	19	FAI	021	BG	1			1				
04 Dec	N20W40	181	0220	17	FSO	011	B								
05 Dec	N19W49	177	0140	02	HAX	003	A								
06 Dec	N20W59	174	0140	04	HAX	004	B								
07 Dec	N19W78	180	0120	17	FSO	005	B								
08 Dec	N20W79	168	0040	02	HRX	002	A				1				
09 Dec	N20W92	168									2				
								15	0	1	33	3	0	1	0

Crossed West Limb.
Absolute heliographic longitude: 182

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics: Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares: X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
		Region 8397													
29 Nov	N15E70	137	0130	09	DSO	004	B				2				
30 Nov	N15E64	130	0300	20	FKO	009	B	1			2				
01 Dec	N14E46	135	0310	12	EAO	008	B	1			2				
02 Dec	N15E32	136	0240	12	EAO	010	B								
03 Dec	N14E19	135	0200	11	EAO	007	B	1			1				
04 Dec	N14E06	135	0260	11	CHO	008	B								
05 Dec	N15W08	136	0210	03	HAX	001	A								
06 Dec	N16W24	139	0210	04	HAX	003	A	1			1				
07 Dec	N16W36	138	0190	08	CAO	006	B								
08 Dec	N16W50	139	0150	02	HSX	002	A								
09 Dec	N16W63	138	0120	03	HSX	002	A								
10 Dec	N16W76	138	0080	03	HAX	002	A								
11 Dec	N16W89	138	0070	02	HAX	001	A								
								4	0	0	8	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 135

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8398												
30 Nov	N18W05	199	0060	07	CAO	012	B								
01 Dec	N18W15	196	0070	07	CAO	008	B								
02 Dec	N18W28	196	0020	08	CAO	010	B								
03 Dec	N18W40	195	0020	04	BXO	007	B								
04 Dec	N18W52	193	0010	04	BXO	004	B								
05 Dec	N17W60	188	0160	04	CSO	002	B								
06 Dec	N18W72	187	0200	03	HSX	001	A				1				
07 Dec	N20W86	188	0080	02	HAX	001	A								
								0	0	0	1	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		199													
			Region 8399												
30 Nov	N30E23	171	0040	08	BXO	004	B								
01 Dec	N24E09	172	0060	05	BXO	005	B								
02 Dec	N26W04	172	0010	06	BXO	003	B								
03 Dec	N29W22	177	0000	01	AXX	001	A								
04 Dec	N29W35	177						1			1				
05 Dec	N29W48	177									1				
06 Dec	N29W61	177													
07 Dec	N29W66	168	0010	01	AXX	002	A								
08 Dec	N29W80	169	0040	06	CRO	003	B				1				
09 Dec	N29W92	167	0030	10	CRO	003	B				2				
								1	0	0	5	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		172													
			Region 8400												
30 Nov	S18E08	186	0010	02	BXO	002	B								
01 Dec	S18W07	188	0010	01	AXX	001	A								
02 Dec	S18W21	189	0000	00	AXX	001	A								
03 Dec	S18W34	189													
04 Dec	S18W47	189													
05 Dec	S18W60	189													
06 Dec	S18W73	189													
07 Dec	S18W86	189													
								0	0	0	0	0	0	0	0
Crossed West Limb.															
Absolute heliographic longitude:		188													

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8401												
30 Nov	N12E27	167	0010	01	BXO	003	B								
01 Dec	N12E16	165	0010	05	BXO	003	B								
02 Dec	N12E01	167	0010	02	BXO	004	B								
03 Dec	N12W13	168	0030	04	BXO	005	B				1				
04 Dec	N10W26	167	0030	05	CRO	004	B								
05 Dec	N11W40	168	0020	06	BXO	003	B								
06 Dec	N11W53	168													
07 Dec	N11W66	168													
08 Dec	N11W79	168													
09 Dec	N11W92	168													
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 167

			Region 8402												
01 Dec	N17E64	117	0390	15	EAO	006	B	1			2				
02 Dec	N18E53	115	0370	21	FAO	009	B	1			2				
03 Dec	N18E39	115	0270	16	FAO	012	B				2				
04 Dec	N16E26	115	0270	16	FKO	010	B	1			1				
05 Dec	N16E10	118	0360	11	EKO	010	B								
06 Dec	N16W02	117	0250	09	DKO	012	B	1			2				
07 Dec	N17W17	119	0230	09	DAO	010	B	2			4				
08 Dec	N17W31	120	0160	09	DSO	011	B								
09 Dec	N16W45	120	0120	08	DSO	006	B	2			2				
10 Dec	N17W56	118	0120	09	DSO	005	B								
11 Dec	N16W71	120	0100	10	DSO	003	B								
12 Dec	N17W81	116	0060	01	HSX	001	A								
13 Dec	N17W93	115	0050	01	HSX	001	A								
								8	0	0	15	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 117

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8403												
03 Dec	N20E50	104	0020	02	HSX	001	A								
04 Dec	N19E38	103	0030	01	HSX	001	A								
05 Dec	N19E26	102	0060	02	HSX	001	A								
06 Dec	N19E15	100	0050	05	CSO	004	B								
07 Dec	N20W02	104	0040	01	HSX	001	A								
08 Dec	N20W15	104	0040	01	HSX	001	A								
09 Dec	N20W28	103	0040	02	HSX	001	A								
10 Dec	N21W41	103	0030	01	HSX	001	A								
11 Dec	N20W54	103	0040	02	HSX	001	A								
12 Dec	N20W66	101	0030	01	HSX	001	A								
13 Dec	N20W80	102	0020	01	AXX	001	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 104

			Region 8404												
06 Dec	S22E02	113	0080	07	DSO	009	B								
07 Dec	S23W12	114	0120	09	DAI	016	B				1				
08 Dec	S24W25	114	0280	09	DAI	022	B	3			4	1			
09 Dec	S23W38	113	0340	11	EKO	021	B								
10 Dec	S22W51	113	0320	12	EKC	022	B				3				
11 Dec	S22W66	115	0410	14	EKI	018	B	1			3				
12 Dec	S22W77	112	0230	10	DAO	013	B	2			3				
13 Dec	S24W86	108	0110	06	CAO	005	B	2			2				
								8	0	0	16	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 113

			Region 8405												
06 Dec	S16E64	051	0110	04	CSO	003	B								
07 Dec	S16E49	053	0060	07	CSO	009	B	2			4				
08 Dec	S15E35	054	0040	08	CSO	012	B	2			4				
09 Dec	S15E21	054	0030	09	CSO	007	B	4			3	1			
10 Dec	S15E06	056	0020	07	CSO	007	B				2				
11 Dec	S14W08	057	0020	05	BXO	004	B	1			3				
12 Dec	S14W21	057						1			2	1			
13 Dec	S14W34	057													
								10	0	0	18	2	0	0	0

Still on Disk.
Absolute heliographic longitude: 056

Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	M	X	Optical S	1	2	3	4
			Region 8406												
07 Dec	S27E71	031	0100	14	CSO	003	B								
08 Dec	S27E62	027	0180	15	ESO	007	B								
09 Dec	S28E48	027	0140	17	FAO	006	B	1			1				
10 Dec	S27E28	034	0050	02	HSX	001	A								
11 Dec	S28E16	033	0070	02	HSX	001	A								
12 Dec	S28E02	033	0030	01	HSX	001	A								
13 Dec	S26W09	031	0030	03	CSO	002	B								
								1	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		033													
			Region 8407												
08 Dec	S17E07	082	0050	06	DSO	008	B				1				
09 Dec	S17W07	082	0050	07	DRO	006	B								
10 Dec	S17W20	082	0020	06	BXO	008	B								
11 Dec	S16W33	082	0010	03	BXO	003	B								
12 Dec	S16W46	082													
13 Dec	S16W59	082													
								0	0	0	1	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		082													
			Region 8408												
10 Dec	S18E27	035	0010	05	BXO	005	B	1			2				
11 Dec	S18E15	034	0020	07	BXO	010	BG	2			6				
12 Dec	S18E01	034	0090	09	DSO	019	BG	1			6				
13 Dec	S18W13	035	0190	07	DAO	019	BGD	3			8				
								7	0	0	22	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		034													
			Region 8409												
10 Dec	S29E43	019	0150	06	DSO	004	B								
11 Dec	S29E27	022	0210	11	EAO	013	BG	1			2				
12 Dec	S29E13	022	0200	12	ESO	021	BG	2			6				
13 Dec	S28E01	021	0190	13	ESO	024	BG				1				
								3	0	0	9	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		021													

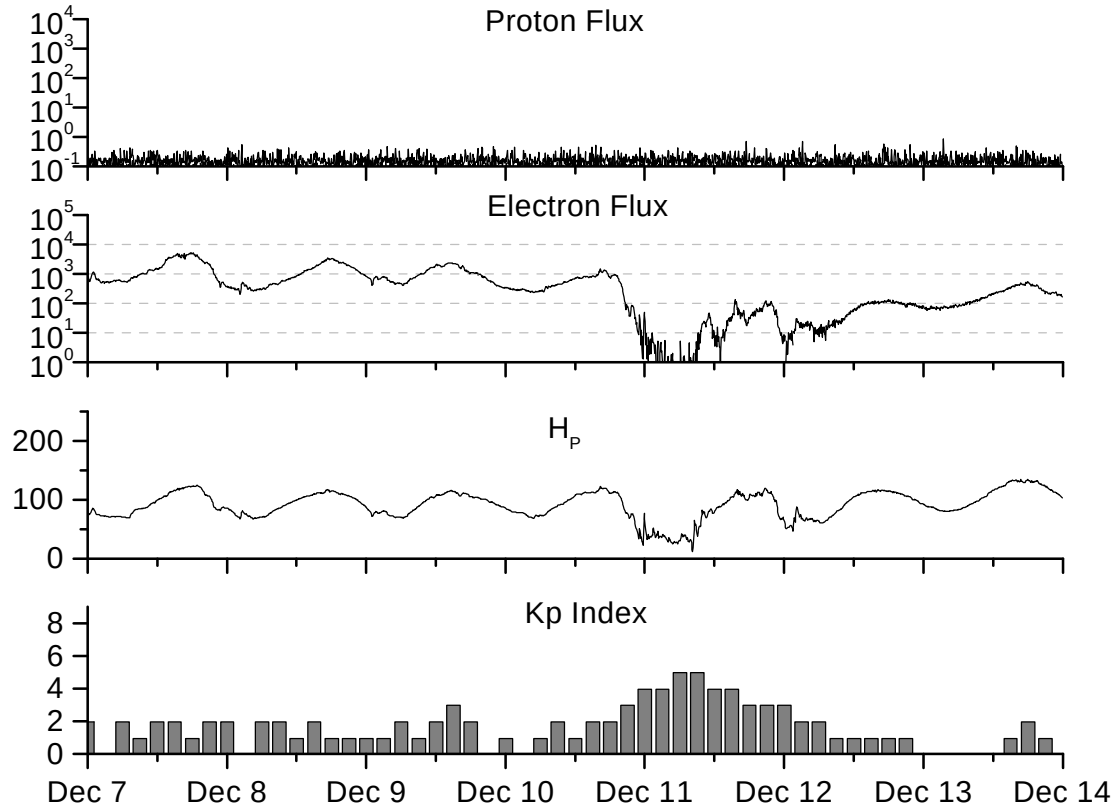
Region Summary-continued

Date	Location (° Lat ° CMD)	Helio Lon	Sunspot Characteristics Area (10^{-6} hemi)	Extent (helio)	Spot Class	Spot Count	Mag Class	Flares X-ray C	X-ray M	X-ray X	Optical S	Optical 1	Optical 2	Optical 3	Optical 4
			Region 8410												
11 Dec	N23E77	332	0080	04	HSX	001	A								
12 Dec	N23E61	334	0070	01	HSX	001	A								
13 Dec	N24E48	334	0060	02	HSX	001	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		334													
			Region 8411												
11 Dec	S28E64	345	0010	00	AXX	001	A								
12 Dec	S29E52	343	0030	05	CSO	005	B				1				
13 Dec	S28E39	343	0030	05	BXO	007	B				1				
								0	0	0	2	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		343													
			Region 8412												
13 Dec	S15W26	048	0010	01	AXX	002	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude:		048													

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

	Sunspot Numbers					Radio Flux		Geomagnetic	
	Observed values		Ratio	Smooth values		**Penticton	Smooth	Planetary	Smooth
Month	SWO	RI	RI/SWO	SWO	RI	10.7 cm	Value	Ap	Value
					1996				
December	21.1	13.3	0.63	16.2	10.4	77.8	73.3	07	09.3
					1997				
January	09.0	05.7	0.63	16.5	10.5	74.0	73.4	09	09.3
February	11.3	07.6	0.67	17.4	11.0	73.8	73.7	11	09.2
March	14.4	08.7	0.60	20.4	13.5	73.5	75.1	08	08.9
April	24.5	15.5	0.63	24.0	16.5	74.5	76.8	10	08.6
May	28.6	18.5	0.65	26.4	18.3	74.6	78.4	08	08.6
June	22.1	12.7	0.57	29.0	20.3	71.7	80.1	07	08.6
July	17.0	10.4	0.61	32.4	22.6	71.1	81.8	06	08.5
August	36.7	24.4	0.66	35.9	25.0	79.0	83.4	07	08.3
September	52.8	51.3	0.88	40.5	28.3	96.2	85.7	10	08.4
October	33.6	22.8	0.68	45.4	31.8	84.9	88.6	11	08.6
November	53.5	39.0	0.73	49.3	35.0	99.5	91.3	11	09.0
December	57.9	41.2	0.71	54.2	39.0*	98.8	94.2*	05	09.5
					1998				
January	51.8	31.9	0.62	60.6	43.7*	93.4	97.5*	08	09.9*
February	54.4	40.3	0.74	67.4	48.8*	93.4	101.7*	08	10.5*
March	81.8	54.8	0.67	73.3	53.4*	109.1	105.8*	13	11.2*
April	73.6	53.4	0.73	77.7	56.5*	108.3	109.1*	10	11.4*
May	74.3	56.3	0.76			106.7		18	
June	93.6	70.7*	0.76*			108.4*		10	
July	98.3	66.2*	0.67*			114.0*		11*	
August	118.6	91.7*	0.77*			136.0*		18*	
September	119.0	92.9*	0.78*			138.4*		14*	
October	77.0	55.6*	0.72*			121.9*		13*	
November	99.5	73.6*	0.74*			140.2*		16*	

*Preliminary estimates.
The lowest smoothed sunspot indices number for Cycle 22, RI = 8.0, occurred in May 1996. 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 07 December 1998

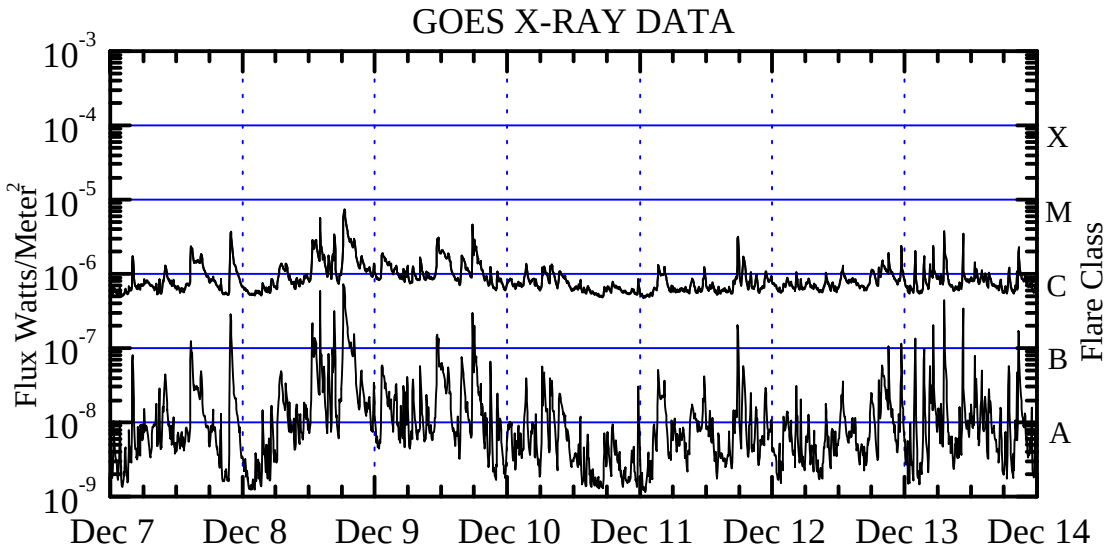
Protons plot contains the five-minute averaged integral proton flux (protons/ cm^2-sec-sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

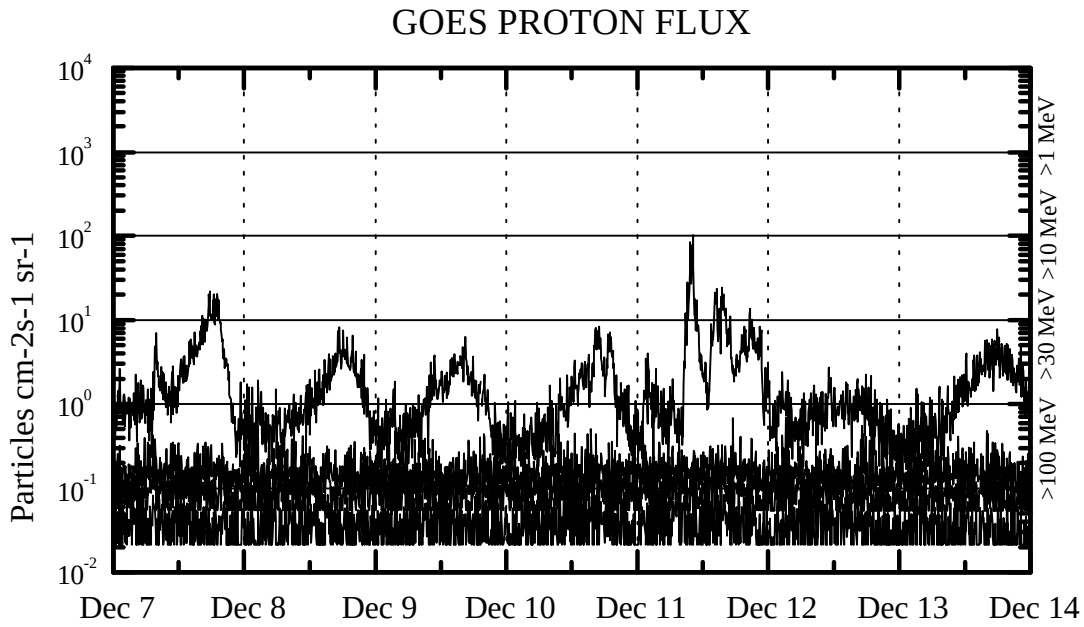
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-8.

Hp plot contains the five minute averaged magnetic field H component in nanoteslas (nT) as measured by GOES-8. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

Kp 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 and Heartland, UK. 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 Kp 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 Kp are " global " parameters that are applicable to a first order approximation over large areas. Hparallel 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

X-ray plot contains five minute averaged x-ray flux (watts/m^2) as measured by GOES 8 and 10 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/cm^2-sec-sr) as measured by GOES-8 (W75) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm^2-sec-sr) at greater than 10 MeV.