

Space Weather Highlights
27 April-03 May 1998

Solar activity remained at high levels. Region 8210 (S17, L=140, class/area Eki/420 on 02 May) produced three major flares. The first was an X1/2B at 27/0920UT with an associated 950 SFU Tenflare, Type IV radio sweep and a halo-CME. The second flare was an M6/3B at 29/1637UT, accompanied by a Type IV radio sweep and an Earth-directed, halo-CME. The third flare was an X1/3B at 02/1342UT with an associated 1300 SFU Tenflare, Type IV radio sweep, and a partial-halo CME. Region 8210's magnetic structure became increasingly complex before and during the major flare activity, but appeared to be slowly simplifying by the end of the period. Region 8214 (N27, L = 096, class/area Esc/300 on 03 May) grew at a rapid to moderate pace during 01 - 03 May and produced and produced an isolated M-class flare.

Solar wind data were available from the ACE spacecraft during most of the period. Velocities gradually decreased from 500 to 300 km/sec during 27 - 29 April, then abruptly increased from 300-380 km/sec following the passage of an interplanetary shock at 30/0933UT. Velocities continued to increase through 02 May, and peaked at 680 km/sec. Thereafter, velocities gradually decreased. Densities ranged from 02 - 06 p/cc during most of the period. However, densities increased to a peak of 37 p/cc on 30 April following the shock passage mentioned above. Bz hovered around zero through 29 April, then briefly shifted south following the 30/0933UT shock passage (maximum deflection minus 11 nT (GSM)). Bz shifted south again late on 01 May and remained so for the balance of the period, ranging from zero to minus 14 nT. Solar sector orientation was mostly toward (phi angle near 315 degrees) during 27 - 29 April. Orientation was not discernible during 20 April, then became away (phi angle near 135 degrees) during 01 - 02 May. Orientation shifted back to toward on 03 May.

A Solar Proton Event (SPE) followed the X1/3B flare of 02 May. The greater than 10 MeV proton flux reached event threshold at 02/1420UT, reached a peak of 150 PFU at 02/1650UT. The greater than 100 MeV proton flux reached event threshold at 02/1405UT, and reached a maximum of 07.6 PFU at 02/1450UT. Both events ended on 03 May. A polar cap absorption event occurred in response to the SPE (estimated maximum absorption 3.7 dB).

The greater than 2 MeV electron flux at geosynchronous altitude was mostly high through 30 April, then declined to normal to moderate levels for most of the rest of the period. However, fluxes briefly rose above event threshold on 02 and 03 May.

The geomagnetic field was quiet to unsettled through 29 April. The Boulder USGS magnetometer detected a sudden impulse (SI) of 31 nT at 30/0933UT, followed by unsettled to active levels. Conditions declined to quiet levels during most of 01 May. A sudden storm commencement (SSC) of 36 nT occurred at 01/2158UT and was followed by minor to severe storm levels for the rest of the period. This activity was likely due to the M6/3B flare of 29 April.

Space Weather Forecast
06 May 1998 - 01 June 1998

Solar activity is expected to range from low to moderate. Region 8210 is expected to produce isolated M-class flares until its departure on 07 May. There is also a slight chance for another major flare from this region. Region 8214 may produce M-class flares before departing the limb on 10 May.

Region 8210 may produce another solar proton event before departing the west limb on 08 May.

The greater than 2 MeV electron flux at geosynchronous altitude is expected to be at moderate to high levels through 10 May and again during 22 - 25 May. Mostly normal fluxes are expected during the rest of the period.

The geomagnetic field is expected to be at unsettled to minor storm levels through 07 May as the current disturbance runs its course. Active conditions are expected during 21 - 23 May due to a recurrent coronal hole high-speed wind stream. Quiet to unsettled conditions are expected for the rest of the period.



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
27 April	91	19	200	B1.4	1	0	1	1	0	1	0	0
28 April	98	54	330	B2.1	0	0	0	8	0	0	0	0
29 April	101	65	250	B2.0	2	1	0	6	2	0	1	0
30 April	103	74	310	B3.3	1	0	0	7	0	1	0	0
01 May	113	89	490	B2.4	7	2	0	19	1	0	0	0
02 May	117	110	660	B4.2	6	0	1	13	1	0	1	0
03 May	117	123	770	B2.9	3	1	0	10	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
27 April	2.3E+6	4.0E+4	4.2E+3		3.8E+8	
28 April	1.1E+6	3.0E+4	4.0E+3		4.9E+8	
29 April	1.3E+6	2.7E+4	3.8E+3		6.9E+8	
30 April	2.1E+7	9.1E+4	3.9E+3		2.7E+8	
01 May	2.0E+7	9.2E+4	3.4E+3		7.6E+6	
02 May	1.6E+7	2.4E+6	1.5E+5		1.6E+7	
03 May	1.4E+7	1.8E+6	6.4E+4		1.1E+7	

Daily Geomagnetic Data

Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
27 April	12	4-4-2-2-2-1-2-2	21	5-3-2-4-5-2-2-1	14	5-4-3-3-3-2-2-2
28 April	7	3-2-2-1-2-1-2-2	18	3-3-3-5-4-2-1-2	10	3-3-3-2-2-2-2-2
29 April	5	2-2-1-0-1-2-1-2	7	1-2-1-3-4-0-0-0	6	2-1-1-2-2-2-2-2
30 April	12	2-1-0-3-3-4-2-3	15	1-1-0-2-5-5-2-2	12	2-1-1-3-4-4-3-3
01 May	8	1-2-2-2-2-1-1-4	8	1-2-2-1-3-1-2-3	8	2-2-2-1-2-2-1-4
02 May	41	3-5-5-4-5-4-4-6	71	3-4-4-6-8-6-6-3	56	3-5-5-6-7-6-4-5
03 May	37	5-5-4-3-4-4-5-5	68	5-6-7-7-5-4-4-4	57	6-7-5-5-5-4-5-5

Alerts and Warnings Issued

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
27 Apr 0001	>2MeV Electron Event in Progress ≥1000pfu	26 Apr
27 Apr 0001	K= 4 Observed	26 Apr 21-24
27 Apr 0300	K= 5 Observed	27 Apr 00-03
27 Apr 0612	A ≥ 20 Observed	24 Apr 0600
27 Apr 0937	Type IV Radio Emission	27 Apr 0903
27 Apr 1052	2695MHz Radio Burst	27 Apr 0850
27 Apr 1140	X-Ray event X1/2B	27 Apr 0855
27 Apr 1219	Proton Event Warning ≥ 10pfu @ ≥10MeV	27 Apr 1900

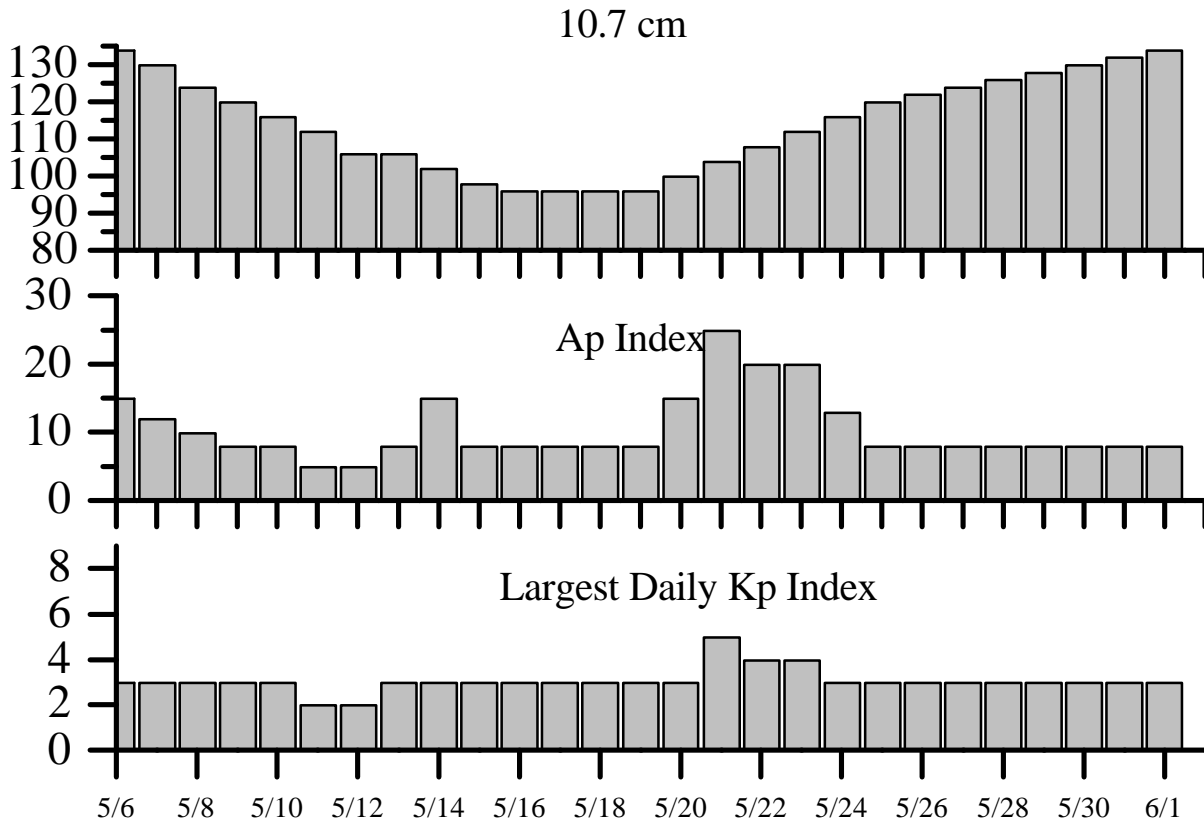


Alerts and Warnings Issued- continued.

Date and Time of Issue (UT)	Type of Alert or Warning	Date and Time of Event (UT)
27 Apr 2015	A \geq 20 Watch	29 Apr
27 Apr 0012	2-245 MHz Radio Noise Storms	26 Apr
27 Apr 2017	A \geq 20 Watch	30 Apr
27 Apr 2146	Proton Event Warning \geq 10pfu @ \geq 10MeV	27 Apr 2144
28 Apr 0008	>2 MeV Electron Event in Progress \geq 1000pfu	27 Apr
28 Apr 0012	1-245 MHz Radio Burst	27 Apr
28 Apr 0012	245 MHz Radio Noise Storm	27 Apr
29 Apr 0000	>2 MeV Electron Event in Progress \geq 1000pfu	28 Apr
29 Apr 0025	1-245 MHz Radio Burst	28 Apr
29 Apr 1710	2695MHz Radio Burst	29 Apr 1710
29 Apr 1724	X-Ray event M6/3B	29 Apr 1606
29 Apr 2001	Type IV Radio Emission	29 Apr 1707
29 Apr 2144	A \geq 20 Watch	01 May
30 Apr 002	>2 MeV Electron Event in Progress \geq 1000pfu	29 Apr
30 Apr 1053	Sudden Impulse of 31 nT observed at Boulder	30 Apr 0933
30 Apr 1330	A \geq 30 Watch	2 May
30 Apr 1520	K= 4 Observed	30 Apr 12-15
30 Apr 2150	2695MHz Radio Burst	30 Apr 2121
01 May 001	>2 MeV Electron Event in Progress \geq 1000pfu	30 Apr
01 May 2208	Sudden Impulse 36 nT observed at Boulder	01 May 2158
02 May 000	K= 4 Observed	01 May 21-24
02 May 0010	13-245 MHz Radio Bursts	01 May
02 May 0010	245 MHz Radio Noise Storm	01 May
02 May 0047	>2 MeV Electron Event \geq 1000pfu	02 May 0046
02 May 528	2695MHz Radio Burst	02 May 0502
02 May 603	K \geq 6 Observed	02 May 03-06
02 May 908	A \geq 20 Observed	02 May 0900
02 May 1206	A \geq 30 Observed	02 May 1200
02 May 1356	Type IV Radio Emission	02 May 1338
02 May 1405	Proton Event Warning \geq 10pfu @ \geq 10MeV	02 May 1800
02 May 1424	Proton Event >1pfu @ \geq 100MeV	02 May 1405
02 May 1439	Proton Event \geq 10pfu @ \geq 10MeV	02 May 1420
02 May 1527	2695MHz Radio Burst	02 May 1337
02 May 1628	A \geq 50 Watch	05 May
03 May 0002	K= 5 Observed	02 May 21-24
03 May 0056	>2MeV Electron Event in Progress \geq 1000pfu	02 May
03 May 0312	A \geq 50 Observed	03 May 0300
03 May 0312	K \geq 6 Observed	03 May 00-03
03 May 0650	Proton Event >1pfu @ \geq 100MeV ended	02 May 1405
02 May 1439	Proton Event \geq 10pfu @ \geq 10MeV in progress	02 May 1420
03 May 2056	Sudden Impulse of 10 nT at Boulder	03 May 1744
03 May 2146	2695MHz Radio Burst	03 May 2117
03 May 2146	Type IV Radio Emission	03 May 2117



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
06 May	134	15	3	20 May	100	15	3
07	130	12	3	21	104	25	5
08	124	10	3	22	108	20	4
09	120	8	3	23	112	20	4
10	116	8	3	24	116	13	3
11	112	5	2	25	120	8	3
12	106	5	2	26	122	8	3
13	106	8	3	27	124	8	3
14	102	15	3	28	126	8	3
15	98	8	3	29	128	8	3
16	96	8	3	30	130	8	3
17	96	8	3	31	132	8	3
18	96	8	3	01 Jun	134	8	3
19	96	8	3				



Energetic Events

Date	Time (UT)			X-ray		Optical Information			Peak		Sweep Freq		
	Begin	Max	½	Class	Integ	Imp Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max		Flux		Lat	CMD		245	2695	II	IV
27 Apr	0855	0920	0938	X1.0	.160	2B	S16E50	8210	3400	950		3	
29 Apr	1606	1637	1659	M6.8	.100	3B	S18E20	8210	1400	100		3	
01 May	1254	1300	1304	M1.1	.004	1N	N25E40	8214					
01 May	2236	2254	2308	M1.2	.016	SF	N25E35	8214	700	56			
02 May	1331	1342	1351	X1.1	.067	3B	S15W15	8210	14000	1300		2	
03 May	2112	2129	2149	M1.4	.021	1B	S13W34	8210	840	810		3	

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical Location Lat CMD	Rgn #
	Begin	Max	End				
27 April	0836	0911	1234	X1.0	2B	S16E50	8210
	1451	1454	1456		SF	S17E43	8210
	1607	1611	1613	C1.2			
28 April	1321	1324	1327	B2.9			
	1523	1534	1538	B3.8	SF	S27W62	8212
	1601	1601	1610	B4.0	SF	S18E32	8210
	1801	1807	1808		SF	S21E33	8210
	1837	1839	1841		SF	S17E35	8210
	1911	1913	1915		SF	S25E25	8210
	2031	2033	2047		SF	S15E35	8210
	2123	2124	2129	B3.8	SF	S17E31	8210
29 April	2341	2345	2358	B8.3	SF	S17E32	8210
	0044	0049	0054	B3.2			
	0138	0143	0203	C4.3	1F	S19E27	8210
	0319	0323	0327	B7.6			
	0353	0358	0402	B4.6			
	0409	0413	0415	B3.9			
	0514	0519	0527	B7.7	SF	S17E29	8210
	0539	0540	0548	B7.6	SF	S19E24	8210
	0701	0702	0718	B5.1	SF	S20E24	8210
	0725	0726	0740	B3.9	SF	S17E21	8210
	0745	0818	0907	C1.7	1F	S17E23	8210
	0959	1040	1116	B7.8			
	1344	1349	1356		SF	S16E20	8210
30 April	1605	1630	2023	M6.8	3B	S18E20	8210
	2147	2148	2214		SF	S14E14	8210
	0634	0638	0640	B3.2			
	1335	1338	1341	B3.1			
	1952	1955	2003		SF	N25E51	8214
	2040	2040	2055		SF	N24E50	8214
	2056	2100	2106		SF	N24E48	8214
	2107	2136	2140		SF	N24E49	8214
	2118	2122	2221	C6.6	2N	S21E03	8210



Flare List – continued.

Date	Time			X-ray Class.	Imp / Brtns	Optical	
	Begin	Max	End			Location Lat CMD	Rgn #
30 Apr	2144	2205	2302		SF	N24E49	8214
	2300	2313	2319	B9.5	SF	S18E01	8210
	2302	2323	2359		SF	N25E47	8214
01 May	0303	0308	0312	C1.1			
	0522	0525	0527		SF	N22E41	8214
	0606	0607	0616	B5.8	SF	N23E42	8214
	0851	0903	0916	B9.4	SF	N24E42	8214
	0858	0901	0906		SF	S18E01	8210
	1129	1131	1141	B7.8	SF	N25E41	8214
	1201	1202	1245		SF	N25E40	8214
	1203	1206	1216	C1.9	SF	S17W05	8210
	1246	1258	1345	M1.1	1N	N25E40	8214
	1315	1317	1320		SF	S19E00	8210
	1332	1334	1342		SF	N25E40	8214
	1417	1419	1422		SF	N25E39	8214
	1427	1453	1524	C1.7	SF	S21W03	8210
	1445	1456	1508		SF	N24E40	8214
	1657	1703	1729		SF	S17W11	8210
	1734	1736	1808	C2.1	SF	N26E38	8214
	2005	2011	2033	C2.8	SF	N26E37	8210
	2022	2030	2048		SF	S17W12	8210
	2049	2051	2056		SF	S20W07	8210
	2115	2124	2133	C1.2			
	2143	2151	2201	C2.6	SF	S18W05	8210
	2250	2254	2309	M1.2	SF	N25E35	8214
	02 May	0030	0044	0047		1F	N23E33
0033		0040	0047		SF	S19W07	8210
0155		0201	0228	C2.7	SF	N24E34	8214
0329		0334	0337	C1.1			
0440		0456	0548	C5.4	SF	S20W07	8210
0834		0835	0838		SF	S15W14	8210
0924		0932	0955		SF	N25E30	8214
1006		1020	1035	C1.4			
1044		1049	1056		SF	S20W17	8210
1247		1253	1302		SF	S16W17	8210
1318		1323	1336	B6.5	SF	N25E26	8214
1334		1342	1547	X1.1	3B	S15W15	8210
1545		1545	1548		SF	S12W24	8210
1749		1750	1754	C2.1	SF	N25E20	8214
1859		1905	1929		SF	S15W24	8210
1942		1945	1951	B8.9			
2035		2105	2126	C5.6	SF	S19W20	8210
2125	2125	2135		SF	N27E21	8214	



Flare List – continued.

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
03 May	0548	0552	0555	B4.6				
	B1014	U1015	1045	C2.5	SN	S20W26		8210
	1157	1159	1203		SF	N27E13		8214
	1232	1236	1242		SF	N27E12		8214
	1602	1603	1612	C1.0	SF	N27E07		8214
	1826	1833	1921	C4.0	1F	S17W35		8210
	2003	2005	2012		SF	N24E08		8214
	2014	2025	2034		SF	N25E10		8214
	2018	2025	2030		SF	S16W33		8210
	2056	2056	2100		SF	N25E10		8214
	2115	2124	2227	M1.4	1B	S13W34		8210
	2120	2128	2135		SF	N27E07		8214
	2350	2351	2353		SF	N27E07		8214

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

Region 8206

19 Apr	N23E42	245	0020	03	BXO	003	B											
20 Apr	N25E29	243	0000	00	AXX	001	A											
21 Apr	N24E14	246	0000	00	AXX	001	A											
22 Apr	N24E01	246	0000	00	AXX	001	A											
23 Apr	N24W12	246																
24 Apr	N24W25	246																
25 Apr	N24W38	246																
26 Apr	N24W51	246																
28 Apr	N24W77	246																

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 246

Region 8207

21 Apr	N00W09	269	0000	00	AXX	002	B											
22 Apr	N00W22	269																
23 Apr	N00W35	269																
24 Apr	N00W48	269																
25 Apr	N00W61	269																
26 Apr	N00W74	269																

0 0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 269



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 8208</i>																					
22 Apr	N18E57	190	0000	00	AXX	001	A														
23 Apr	N17E42	192	0000	00	AXX	001	A														
24 Apr	N18E30	191	0000	00	AXX	001	A														
25 Apr	N18E16	191	0000	01	BXO	002	B														
26 Apr	N18E03	191																			
27 Apr	N18W10	191																			
28 Apr	N18W23	191																			
29 Apr	N18W36	191																			
30 Apr	N18W49	191																			
01 May	N18W62	191																			
02 May	N18W75	191																			
03 May	N18W88	191																			

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 191

<i>Region 8209</i>																				
23 Apr	S22W06	240	0000	00	AXX	001	A													
24 Apr	S24W16	237	0000	00	AXX	001	A													
25 Apr	S24W34	241	0000	00	AXX	001	A													
26 Apr	S24W47	241																		
27 Apr	S24W60	241																		
28 Apr	S24W73	241																		
29 Apr	S24W86	241																		

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 240



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 8210</i>																			
24 Apr	S19E70	151	0000	00		000													
25 Apr	S16E67	140	0230	08	DSO	005	B	2				2	1						
26 Apr	S17E56	138	0200	09	CKO	009	B					1							
27 Apr	S17E42	139	0200	08	CKO	009	BD			1	1			1					
28 Apr	S17E30	138	0300	08	CKO	015	BGD					7							
29 Apr	S17E18	137	0230	08	CHO	016	BG	2	1			6	2	1	1				
30 Apr	S16E02	140	0270	10	CHO	022	BG	1				1		1					
01 May	S17W10	138	0340	10	DKI	030	GD	4	1			9							
02 May	S17W22	137	0420	11	EKI	040	BGD	2		1	8					1			
03 May	S17W36	138	0410	10	CKI	030	BG	2	1			2	2						
								13	3	2	37	5	3	2	0				

Still on Disk.

Absolute heliographic longitude: 140

Region 8211

25 Apr	S22W12	219	0000	01	AXX	002	A												
26 Apr	S22W26	220	0000	00	AXX	001	A												
27 Apr	S26W31	212																	
28 Apr	S26W44	212																	
29 Apr	S26W57	212																	

0 0 0 0 0 0 0 0

Died on Disk.

Absolute heliographic longitude: 219

Region 8212

28 Apr	S30W65	233	0020	04	CRO	004	B					1							
29 Apr	S31W81	236	0000	00	AXX	001	A												

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 233

Region 8213

28 Apr	S25E54	114	0010	03	BXO	005	B												
29 Apr	S24E40	115	0020	05	BXO	007	B												
30 Apr	S25E30	112																	
01 May	S25E17	112																	
02 May	S25E04	112																	
03 May	S25W09	112																	

0 0 0 0 0 0 0 0

Still on Disk.

Absolute heliographic longitude: 112



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 8214

29 Apr	N28E60	097	0000	00	AXX	001	A											
30 Apr	N26E47	095	0040	05	CRO	009	B					6						
01 May	N26E33	095	0140	09	DAI	028	BG	1	1			10	1					
02 May	N27E19	096	0200	10	EAI	027	B	2				5	1					
03 May	N27E06	096	0300	13	ESC	050	B	1	1			8						
								4	2	0		29	2	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 096

Region 8215

30 Apr	N31W44	186	0000	04	BXO	002	B											
01 May	N31W57	186																
02 May	N31W70	186																
03 May	N31W83	186																
								0	0	0		0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 186

Region 8216

30 Apr	S21E51	091	0000	00	AXX	001	A											
01 May	S22E38	090	0010	00	AXX	001	A											
02 May	S21E25	090	0000	00	AXX	001	A											
03 May	S22E12	090	0000	01	AXX	002	A											
								0	0	0		0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 090

Region 8217

02 May	S17E74	041	0040	01	HSX	002	A											
03 May	S16E60	042	0060	02	HSX	001	A											
								0	0	0		0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 042



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

Month	Sunspot Numbers				Radio Flux		Geomagnetic		
	Observed SWO	values RI	Ratio RI/SWO	Smooth SWO	values RI	**Penticton 10.7 cm	Smooth Value	Planetary Ap	Smooth Value
1996									
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	0.62	13.4	08.4	71.2	72.0	07	09.3
August	20.5	14.4	0.70	13.1	08.3	72.4	72.1	09	09.4
September	02.9	01.6	0.55	13.3	08.4	69.4	72.3	15	09.3
October	02.3	00.9	0.39	14.0	08.8	69.2	72.6	13	09.1
November	26.7	17.9	0.67	15.4	09.8	78.7	73.0	08	09.1
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	18.4*	74.6	78.4*	08	08.6*
June	22.1	12.7	0.57	29.0	20.4*	71.7	80.1*	07	08.7*
July	17.0	10.5*	0.62*	32.4	22.7*	71.1	81.8*	06*	08.5*
August	36.7	24.7*	0.67*	35.9	25.2*	79.0	83.4*	08*	08.3*
September	58.2	51.3*	0.88*	40.5	28.5*	96.2	85.7*	10*	08.2*
October	33.6	23.3*	0.69*	45.4	32.0*	84.9*	88.6*	11*	08.3*
November	53.5	39.3*	0.73*			99.5*		11*	
December	57.9	41.5*	0.72*			98.8*		05*	
1998									
January	51.8	32.3*	0.62*			93.5*		07*	
February	54.4	40.7*	0.75*			93.6*		07*	
March	81.1	54.8*	0.67*			109.4*		11*	
April	74.0	53.3	0.72*			108.0*		10*	

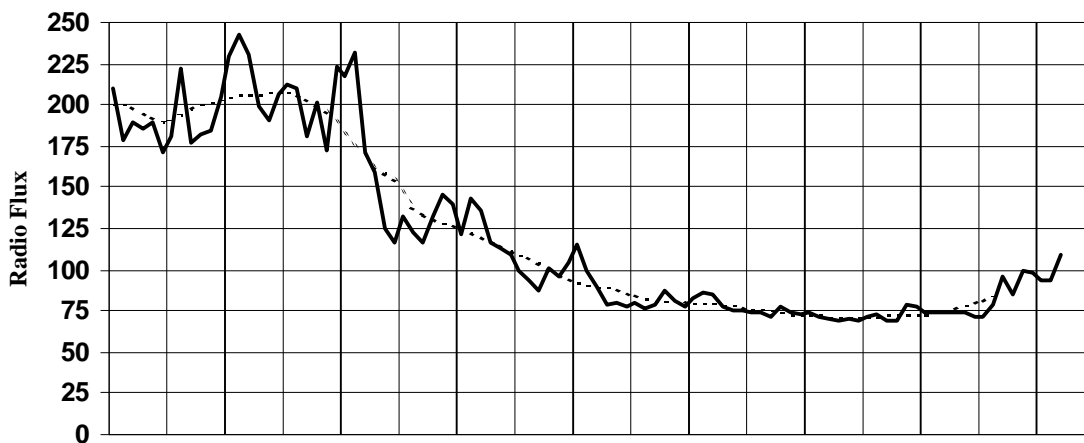
*Preliminary estimates.

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.

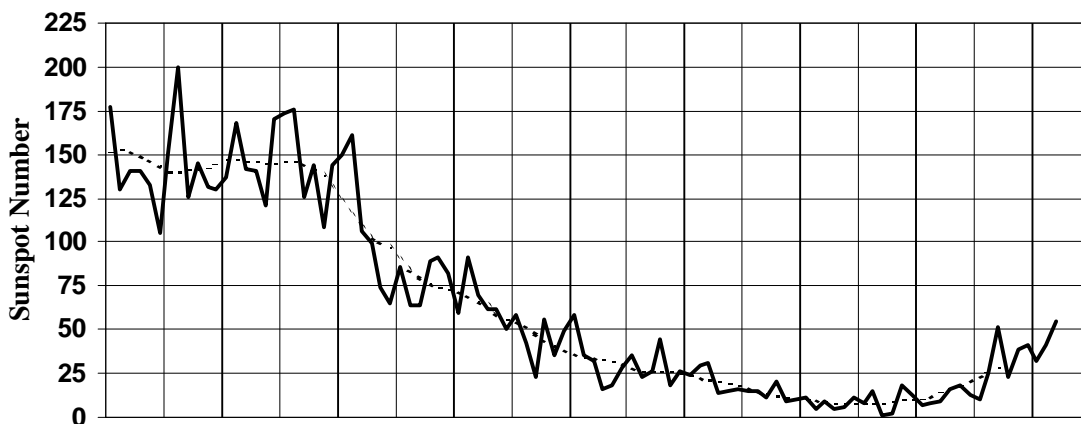
** From June 1991 onward, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.



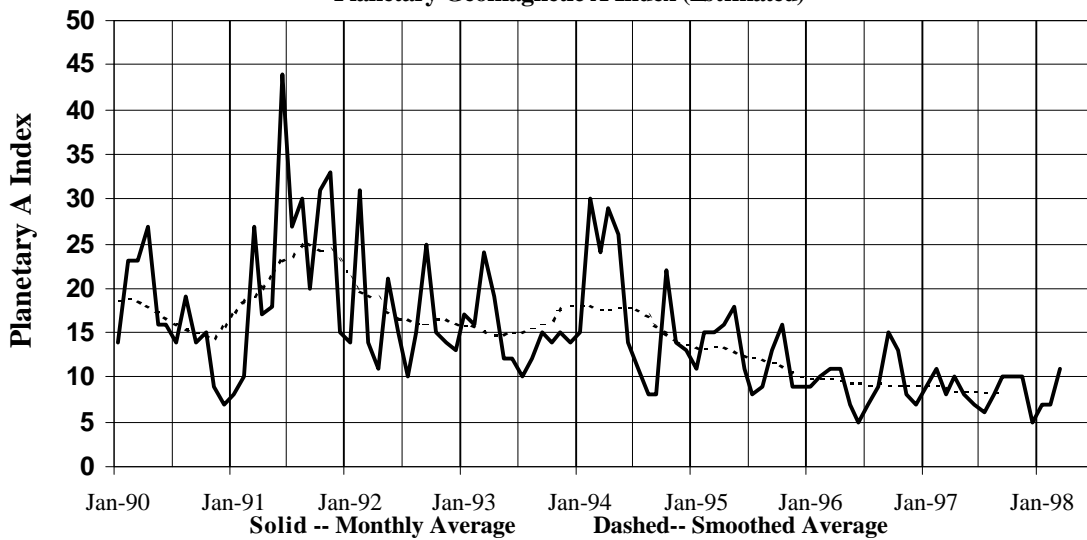
Penticton (DRAO) Radio Flux 2800MHz (10.7cm)

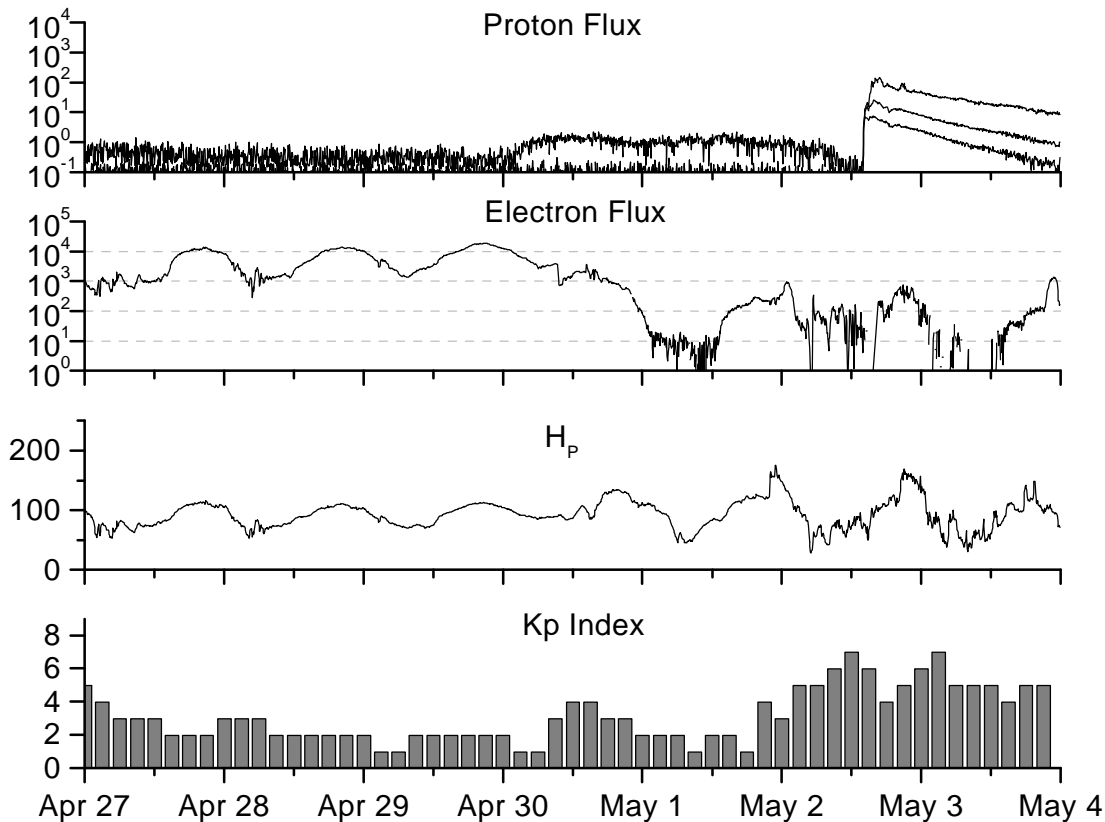


International Sunspot Number



Planetary Geomagnetic A Index (Estimated)





Weekly Geosynchronous Satellite Environment Summary
Week Beginning 27 April 1998

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.

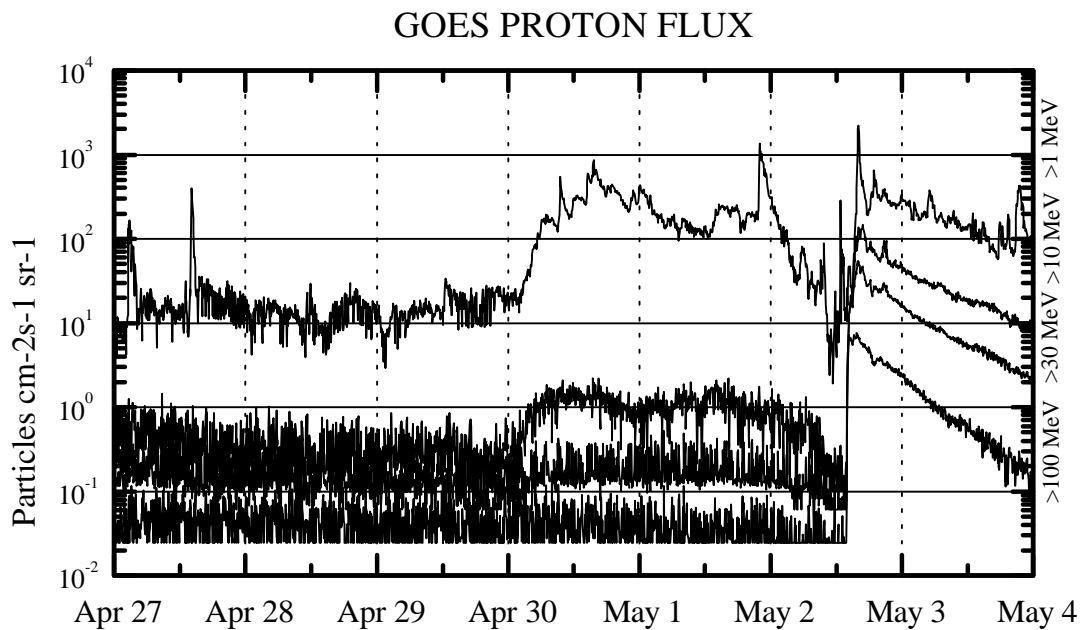
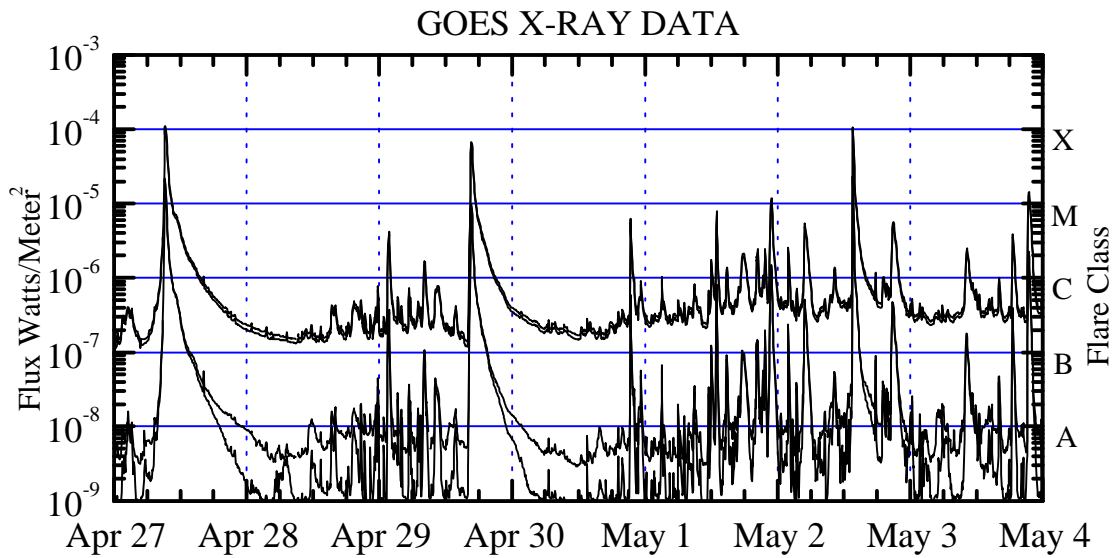
Electrons plot contains the five-minute averaged integral electron flux (electrons/ cm^2 -sec-sr) with energies greater than 2 MeV at GOES-9.

Hp 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.

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

Proton plot contains the five minute averaged integral proton flux (protons/cm²-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/cm²-sec-sr) at greater than 10 MeV.

X-ray plot contains five minute averaged x-ray flux (watts/m²) 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.

