

Solar activity ranged from low to high levels. Activity was moderate during 15 – 17 April due to lesser M-class flares from adjacent Regions 9893 (N19, L = 215, class/area Eai/490 on 09 April) and 9901 (N20, L = 204, class/area Dai/250 on 13 April), and Region 9906 (S16, L = 151, class/area Eki/640 on 14 April). The 9893/9901 region complex rotated out of view on 16 April. Region 9906 produced two long-duration lesser M-class flares on 15 and 17 April, each associated with an Earth-directed halo CME (for flare times and magnitudes, please refer to the Energetic Events or Optical Flares listings). One of these, an M2/2n at 17/0824 UTC, was associated with Types II and IV radio sweeps, a 3000 sfu Tenflare and a solar proton event (see the discussion below). Activity dropped to low levels during 18 – 20 April due to C-class subflares, most of which were produced by Region 9906. Activity increased to high levels on 21 April as Region 9906 produced a long-duration X1/1f flare at 21/0151 UTC while crossing the west limb. This spectacular flare was associated with a 1900 sfu Tenflare, Types II and IV radio sweeps, multiple eruptive prominences, a solar proton event, and a partial-halo CME. Region 9906 began to gradually decay on 18 April, but remained large and complex until it crossed the west limb on 21 April.

Solar wind data were available from NASA Advanced Composition Explorer (ACE) spacecraft for most of the summary period. Coronal mass ejections encountered Earth on 17 and 19 April following flare activity from Region 9906. The 17 April passage began at approximately 17/1022 UTC and was associated with high solar wind speeds (peaks to 620 km/sec) as well as a period of sustained southward IMF Bz (approximately 17/1400 – 2000 UTC) with maximum southerly deflections to minus 28 nT (GSM). The 19 April passage began at approximately 19/0804 UTC and was associated with velocities as high as 700 km/sec and prolonged periods of southward IMF Bz on 19 and 20 April with peak southerly deflections to minus 17 nT (GSM).

A greater than 10 MeV proton event began at geo-synchronous orbit at 17/1530 UTC, reached a peak of 24 pfu at 17/1540 UTC, then ended at 18/0035 UTC. Greater than 100 MeV and greater than 10 MeV proton events followed the X1 flare of 21 April. The greater than 100 MeV event began at 21/0155 UTC, reached a peak of 22.9 pfu at 21/1025 UTC, and was in progress as the period ended. The greater than 10 MeV event began at 21/0225 UTC, reached a peak of 2520 pfu at 21/2320 UTC, and was also in progress as the period

Greater than 2 MeV electron fluxes at geo-synchronous orbit were at normal to moderate levels during most of the period.

Geomagnetic field activity was at quiet to unsettled levels during 15 – 16 April. Activity increased to active to major storm levels on 17 April following a sudden storm commencement (SSC) at 17/1109 UTC (57 nT, Boulder USGS magnetometer). The storm continued into 18 April with active to severe storm levels during the first half of the day and mostly active levels thereafter. Another SSC occurred at 19/0836 UTC (36 nT, Boulder USGS magnetometer) followed by active to severe storm levels that continued into 20 April. The disturbance subsided late on 20 April. Quiet to unsettled levels occurred during the remainder of the period.



Space Weather Outlook

24 April - 20 May 2002

Solar activity is expected to be at low to moderate levels during the period. Isolated low-level M-class flares are likely, particularly during the latter half of the outlook period. There will be a chance for isolated major flare activity during the latter half of the period ended.

The greater than 10 MeV proton event that began on 21 April is expected to end on 25 April (the greater than 100 MeV event ended at 23/2335 UTC). Chances for a proton flare may increase during 10 – 17 May.

Greater than 2 MeV fluxes may reach high levels around 30 April – 02 May. Normal to moderate flux levels are expected during the rest of the period.

Geomagnetic field activity is expected to be at quiet to unsettled levels during most of the period. However, active conditions will be possible on 24 April and during 27 – 30 April.



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
15 April	203	243	2400	C5.4	5	2	0	7	0	0	0	0
16 April	196	172	1540	C1.9	4	1	0	7	0	0	0	0
17 April	194	137	1100	C1.0	7	1	0	12	0	1	0	0
18 April	188	160	1380	C1.3	6	0	0	4	0	0	0	0
19 April	180	182	1430	B8.6	8	0	0	9	0	0	0	0
20 April	177	185	1330	C1.0	10	0	0	2	0	0	0	0
21 April	173	160	1030	C1.3	4	0	1	2	1	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
	15 April	3.4E+5	1.8E+4	2.4E+3		3.3E+5
16 April	1.2E+5	1.2E+4	2.5E+3		1.6E+5	
17 April	1.9E+7	4.7E+5	2.7E+3		6.5E+5	
18 April	4.4E+7	3.1E+5	2.1E+3		4.4E+6	
19 April	5.4E+7	1.9E+5	2.1E+3		2.8E+7	
20 April	1.1E+7	3.5E+4	2.0E+3		9.9E+6	
21 April	1.9E+8	1.3E+8	1.2E+6		1.0E+7	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	15 April	3	2-1-0-0-1-1-1-2	*	*-1-*-0-3-3-2-1	7
16 April	5	1-2-3-0-1-1-2-1	5	2-2-3-0-0-1-1-1	10	2-3-3-1-2-3-3-2
17 April	27	2-3-2-4-5-6-4-2	73	2-4-6-7-6-7-6-4	41	2-3-2-6-6-6-5-3
18 April	35	6-6-4-4-4-3-2-3	76	5-5-8-6-5-6-5-3	54	6-7-6-5-4-4-4-3
19 April	36	3-4-3-5-6-5-4-4	106	3-3-4-6-7-9-7-4	44	4-4-4-6-6-5-5-5
20 April	30	6-5-5-3-3-3-3-1	67	6-6-6-6-6-6-5-2	62	7-7-7-6-4-4-4-2
21 April	4	1-1-1-1-1-1-2-2	7	3-2-2-0-1-2-2-2	7	3-2-2-1-2-2-2-3



Alerts and Warnings Issued

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UT
16 Apr 0020	7- 245 MHz Bursts	15 Apr
16 Apr 0020	1- 245 MHz Noise Storms	15 Apr
16 Apr 1208	ALERT: Type II Radio Emission	16 Apr 1046
16 Apr 1515	ALERT: Type II Radio Emission	16 Apr 1441
17 Apr 0054	4- 245 MHz Bursts	16 Apr
17 Apr 0054	1- 245 MHz Noise Storms	16 Apr
17 Apr 839	ALERT: Type II Radio Emission	17 Apr 0808
17 Apr 1002	ALERT: Type IV Radio Emission	17 Apr 0750
17 Apr 1009	SUMMARY: 10cm Radio Burst	17 Apr 0747
17 Apr 1026	WARNING: Geomagnetic K= 4	17 Apr 1030 -1500
17 Apr 1031	ALERT: Geomagnetic K= 4	17 Apr 1030
17 Apr 1043	WARNING: Geomagnetic Sudden Impulse	17 Apr 1045 - 1300
17 Apr 1113	SUMMARY: Geomagnetic Sudden Impulse	17 Apr 1109
17 Apr 1133	ALERT: Geomagnetic K= 5	17 Apr 1133
17 Apr 1147	WARNING: Geomagnetic K = 5	17 Apr 1150 - 1500
17 Apr 1211	SUMMARY: 10cm Radio Burst	17 Apr 1008
17 Apr 1310	WATCH: Geomagnetic A \geq 20	18 Apr
17 Apr 1312	WARNING: Proton 10MeV Integral Flux > 10pfu	17 Apr 1330 - 2359
17 Apr 1430	ALERT: Geomagnetic K= 5	17 Apr 1425
17 Apr 1452	EXTENDED WARNING: Geomagnetic K= 5	17 Apr 1150 - 1800
17 Apr 1541	ALERT: Proton Event 10MeV Integral Flux > 10pfu	17 Apr 1530
17 Apr 1543	WARNING: Geomagnetic K= 6	17/1543 - 18/0000 Apr
17 Apr 1613	ALERT: Geomagnetic K= 6	17 Apr 1612
17 Apr 2014	WATCH: Geomagnetic A \geq 30	19 Apr
17 Apr 2015	WATCH: Geomagnetic A \geq 20	20 Apr
17 Apr 2130	CANCEL WARNING: Geomagnetic K= 6	17 Apr 1543
17 Apr 2132	WARNING: Geomagnetic K= 4	17/2135 - 18/1800 Apr
17 Apr 2311	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	17/1330 - 18/1800 Apr
19 Apr 0029	4 - 245 MHz Bursts	18 Apr
19 Apr 0029	1- 245 MHz Noise Storms	18 Apr
18 Apr 0037	CONT ALERT: Proton Event 10MeV Integral Flux > 10pfu	17 Apr 17 1530
18 Apr 0146	WARNING: Geomagnetic K= 5	18 Apr 0147 -1800
18 Apr 0147	ALERT: Geomagnetic K= 5	18 Apr 0147
18 Apr 0347	ALERT: Geomagnetic K= 7	18 Apr 0345
18 Apr 1501	CANCEL WARNING: Proton 10MeV Integral Flux > 10pfu	17 Apr 1312
18 Apr 1516	SUMMARY: Proton Event 10MeV Integral Flux > 10pfu	17 Apr 1530
19 Apr 0015	WATCH: Geomagnetic A \geq 30	20 Apr
19 Apr 0336	WARNING: Geomagnetic K= 4	19 Apr 0338 - 1800
19 Apr 0342	ALERT: Geomagnetic K= 4	19 Apr 0342
19 Apr 1002	WARNING: Geomagnetic K= 5	19 Apr 1002 - 1800
19 Apr 1007	ALERT: Geomagnetic K= 5	19 Apr 1006
19 Apr 1022	ALERT: Electron 2MeV Integral Flux > 1000pfu	19 Apr 1005
19 Apr 1043	SUMMARY: Geomagnetic Sudden Impulse	19 Apr 0836
19 Apr 1758	EXTENDED WARNING: Geomagnetic K=5	19/1002 - 20/1800 Apr

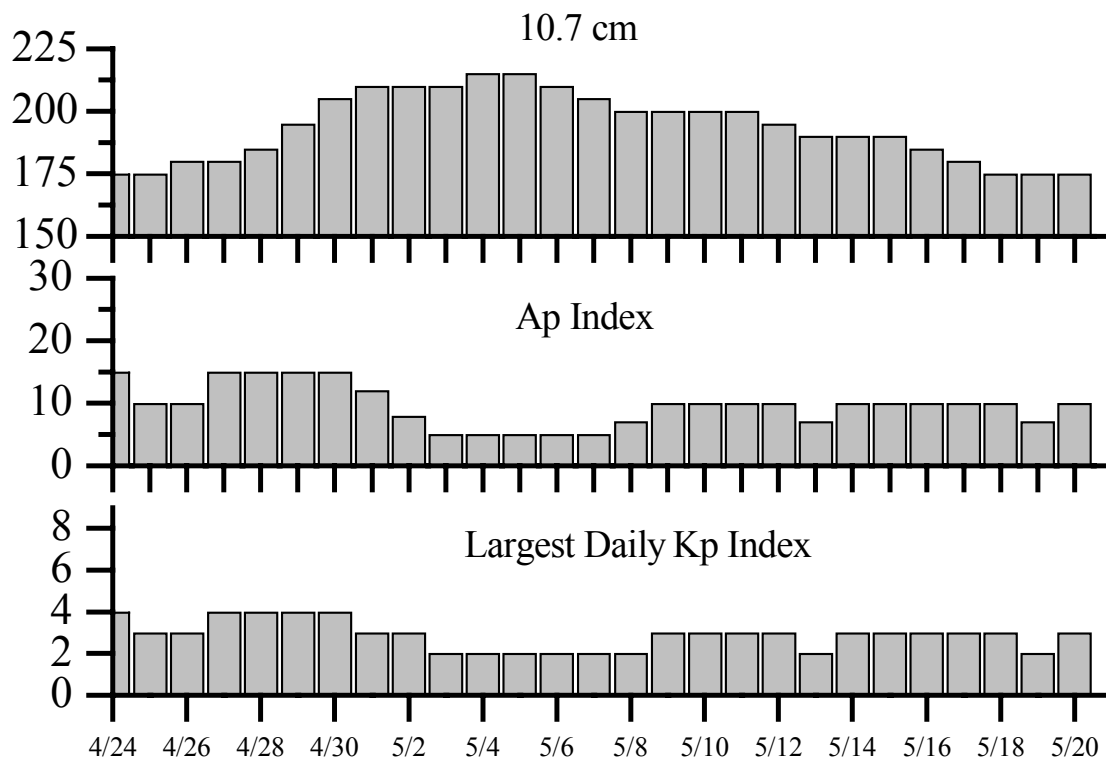


Alerts and Warnings Issued - continued.

<u>Date & Time of Issue</u>	<u>Type of Alert or Warning</u>	<u>Date & Time of Event UT</u>
20 Apr 0200	WARNING: Geomagnetic K= 6	20 Apr 0200 - 1500
20 Apr 204	ALERT: Geomagnetic K= 6	20 Apr 0200
20 Apr 415	ALERT: Geomagnetic K= 6	20 Apr 20 0413
20 Apr 1735	WARNING: Geomagnetic K= 4	20/1740 -21/0600 Apr
21 Apr 120	ALERT: X-Ray Flux exceeded M5	21 Apr 0119
21 Apr 137	WARNING: Proton 10MeV Integral Flux >10pfu	21 Apr 0140 -1500
21 Apr 143	ALERT: Type II Radio Emission	21 Apr 0125
21 Apr 157	WARNING: Proton 100MeV Integral Flux > 1pfu	21 Apr 0200-0800
21 Apr 212	ALERT: Proton Event 100MeV Integral Flux > 1pfu	21 Apr 0155
21 Apr 239	ALERT: Proton Event 10MeV Integral Flux >10pfu	21 Apr 0225
21 Apr 248	SUMMARY: X-ray Event X1.5	21 Apr 0151
21 Apr 256	ALERT: Type IV Radio Emission	21 Apr 0136
21 Apr 318	ALERT: Proton Event 10MeV Integral Flux >100pfu	21 Apr 0300
21 Apr 425	SUMMARY: 10cm Radio Burst	21 Apr 0058 /
21 Apr 527	EXT WARNING: Proton 100MeV Integral Flux > 1pfu	21 Apr 0200 - 1400
21 Apr 528	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	21/0140 - 22/0000 Apr
21 Apr 529	ALERT: Proton Event 10MeV Integral Flux 1000pfu	21 Apr 0510
21 Apr 1348	EXT WARNING: Proton 100MeV Integral Flux >1pfu	21/0200-22 /0001 Apr
21 Apr 2012	WATCH: Geomagnetic A \geq 20	23 Apr
21 Apr 2200	EXT WARNING: Proton 100MeV Integral Flux > 1pfu	21/0200 - 22/1800 Apr
21 Apr 2204	EXT WARNING: Proton 10MeV Integral Flux > 10pfu	21/0140 -23/0200 Apr



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
24 Apr	175	15	4	08 May	200	7	2
25	175	10	3	09	200	10	3
26	180	10	3	10	200	10	3
27	180	15	4	11	200	10	3
28	185	15	4	12	195	10	3
29	195	15	4	13	190	7	2
30	205	15	4	14	190	10	3
01 May	210	12	3	15	190	10	3
02	210	8	3	16	185	10	3
03	210	5	2	17	180	10	3
04	215	5	2	18	175	10	3
05	215	5	2	19	175	7	2
06	210	5	2	20	175	10	3
07	205	5	2				



Energetic Events

Date	Time		X-ray		Optical Information				Peak		Sweep Freq	
	Begin	Max	½ Max	Class	Integ Flux	Imp/Location		Rgn #	Radio Flux		Intensity	
						Brtns	Lat CMD		245	2695	II	IV
15 Apr	0305	0355	0506	M1.2	.071	Sf	S15W01	9906	830	37		
15 Apr	2305	2324	2341	M1.2	.019			9901	31			
16 Apr	1253	1319	1330	M2.5	.029	Sf	N23W88	9893	32	21		
17 Apr	0746	0824	0957	M2.6	.150	2n	S14W34	9906	890	3000	2	1
21 Apr	0043	0151	0238	X1.5	.600	1f	S14W84	9906	3	3		

Flare List

Date	Time			X-ray Class.	Imp / Brtns	Optical		Rgn
	Begin	Max	End			Location Lat CMD		
15 April	0249	0253	0259	C9.8	Sf	N19W79	9893	
	0307	0325	0515	M1.2	Sf	S15W01	9906	
	0634	0638	0645		Sf	N10E68	9909	
	0718	0718	0729		Sf	N24W67	9901	
	0849	0852	0854	C3.0				
	0952	0953	0955		Sf	N21W59	9901	
	1142	1142	1145	C3.0	Sf	N27W71	9901	
	1733	1747	1755	C3.1	Sf	S16W60	9905	
	1935	1939	1941	C1.6				
16 April	2305	2324	2341	M1.2				9901
	0215	0219	0223	C2.5				9904
	0424	0533	0655	C3.8				
	0626	0626	0630		Sf	N24W88	9893	
	1041	1047	1051	C9.3	Sf	S14W77	9904	
	1308	1309	1327		Sf	S14W24	9906	
	1310	1320	1332	M2.5	Sf	N23W88	9893	
	1513	1513	1518		Sf	S15W21	9906	
	1535	1540	1544	C2.9				
	1556	1556	1601		Sf	S08W68	9896	
17 April	1844	1845	1848		Sf	S14W27	9906	
	0038	0039	0044	C9.9	Sf	S13W83	9905	
	0226	0235	0238	C2.3	Sf	S13W84	9905	
	0536	0537	0541		Sf	S13W90	9905	
	0622	0623	0628		Sf	S13W90	9905	
	0657	0657	0703	C1.8	Sf	S13W90	9905	
	0750	0815	A1141	M2.6	2n	S14W34	9906	
	0800	0801	0804		Sf	S13W90	9905	
	1135	1135	1147		Sf	S14W31	9906	
	1200	1201	1206		Sf	S14W87	9905	
	1258	1258	1302		Sf	S13W91	9905	
1338	1342	1347	C6.9	Sf	S17W83	9905		



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn	
	Begin	Max	End		Imp / Brtns	Location Lat CMD		
17 April	1420	1427	1431		Sf	N06E31	9905	
	1420	1426	1430		Sf	N07E39	9909	
	1650	1658	1708	C9.8				
	2259	2304	2307	C4.4				
	2311	2319	2324	C4.4				
18 April	0335	0346	0354	C4.0				
	0527	0530	0533	C1.8				
	0636	0702	0729	C9.4				
	0905	0911	0929		Sf	S13W46	9906	
	1044	1048	1051	C2.6				
	1432	1432	1436	C1.5	Sf	S04W16	9907	
	1512	1612	1657	C3.0			9905	
	1610	1612	1627		Sf	N06E22	9909	
	1642	1642	1647		Sf	S14W51	9906	
19 April	0648	U0650	A0654	C1.7	Sf	S15W57	9906	
	0658	0704	0707	C3.3				
	0754	0754	0755	C2.0	Sf	S16W54	9906	
	0901	0905	0913	C2.3				
	1323	1323	1330		Sf	S12W67	9906	
	1339	1342	1413		Sf	S17W60	9906	
	1431	1433	1436		Sf	S17W59	9906	
	1453	1453	1501		Sf	S17W60	9906	
	1519	1520	1525	C2.5	Sf	S16W59	9906	
	1544	1547	1634		Sf	S16W71	9906	
	1829	1830	1834	C3.4	Sf	S16W57	9906	
	2005	2008	2012	C1.6				
	2107	2116	2130	C2.2				
	20 April	0045	0055	0110	C1.7			
		0417	0428	0446	C2.4			
0513		0519	0525	C2.3				
0908		0932	0956	C1.3				
1141		1209	1225	C2.7				
1419		1426	1450	C2.1				
B1454		U1457	A1506		Sf	N09E07	9912	
B1539		U1551	A1609	C4.1	Sf	N09E06	9912	
1734		1748	1810	C2.2				
1944		2014	2035	C2.5				
2323	2326	2328	C1.9					



Flare List - continued.

Date	Time			X-ray Class.	Optical		Rgn
	Begin	Max	End		Imp / Brtns	Location Lat CMD	
21 April	0059	0131	0251	X1.5	1f	S14W84	9906
	0326	0332	0350		Sf	N10W01	9912
	0607	0612	0625		Sf	N10W02	9912
	1725	1730	1733	C7.9			
	1737	1806	1824	C8.3			
	2011	2016	2018	C2.9			
	2151	2156	2158	C3.4			

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			
<i>Region 9893</i>																		
03 Apr	N18E78	216	0030	05	Hsx	001	A											
04 Apr	N18E64	217	0250	11	Eho	008	B	2			4							
05 Apr	N19E53	215	0320	14	Eai	015	Bg	1			2							
06 Apr	N19E40	215	0370	15	Eki	021	Bg	3			4	1						
07 Apr	N18E27	215	0360	16	Fki	026	Bg	4			3	1						
08 Apr	N18E13	215	0450	16	Fhi	027	Bgd											
09 Apr	N19W00	215	0490	13	Eai	025	Bgd											
10 Apr	N19W14	216	0300	13	Eki	020	Bg	1	1		3	1						
11 Apr	N19W27	216	0340	15	Eai	027	Bg	2			2	1						
12 Apr	N20W39	214	0390	15	Eai	031	Bgd				5							
13 Apr	N18W53	215	0400	16	Fki	017	Bgd				2							
14 Apr	N20W67	216	0400	13	Eai	013	Bgd	3	2		11	2						
15 Apr	N19W81	217	0350	12	Cai	010	Bg	1			1							
								17	3	0	37	6	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 215



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 9895

05 Apr	N06E58	210	0020	07	Bxo	003	B										
06 Apr	N06E45	210	0020	04	Bxo	003	B										
07 Apr	N07E37	205															
08 Apr	N07E24	205															
09 Apr	N07E11	205															
10 Apr	N07W02	205															
11 Apr	N07W15	205															
12 Apr	N07W28	205															
13 Apr	N07W41	205															
14 Apr	N07W54	205															
15 Apr	N07W67	205															

0 0 0 0 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 205

Region 9896

05 Apr	S11E74	194	0100	02	Hsx	001	A										
06 Apr	S11E61	194	0110	02	Hsx	001	A										
07 Apr	S11E47	194	0080	02	Hsx	001	A										
08 Apr	S11E34	194	0080	02	Hsx	001	A										
09 Apr	S11E21	194	0100	02	Hsx	002	A										
10 Apr	S11E08	194	0110	02	Hsx	001	A										
11 Apr	S11W07	196	0110	02	Hsx	001	A										
12 Apr	S11W19	194	0080	05	Dso	005	B										
13 Apr	S10W33	195	0100	02	Hax	001	A										
14 Apr	S09W46	195	0090	02	Hsx	001	A										
15 Apr	S09W60	196	0090	02	Hsx	001	A										
16 Apr	S10W74	197	0090	02	Hsx	001	A					1					
17 Apr	S10W85	195	0040	02	Hsx	001	A										

0 0 0 1 0 0 0 0

Crossed West Limb.

Absolute heliographic longitude: 196



Region Summary - continued.

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		
<i>Region 9901</i>																	
07 Apr	N20E37	204	0060	06	Bxo	008	B					2					
08 Apr	N19E24	204	0130	07	Dai	017	B	2				3					
09 Apr	N19E11	204	0200	07	Dai	011	B										
10 Apr	N20W02	204	0190	09	Dai	019	Bg					2					
11 Apr	N21W14	203	0190	07	Dai	016	Bgd					1					
12 Apr	N21W26	201	0190	06	Dai	017	Bgd		1				1				
13 Apr	N20W39	201	0250	08	Dai	020	Bgd	1				1					
14 Apr	N22W56	205	0180	08	Dao	014	B		1			3					
15 Apr	N21W70	206	0350	09	Dki	011	Bgd	1	1			3					
16 Apr	N21W86	209	0270	03	Hkx	003	A										
								4	3	0	15	1	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 204

<i>Region 9902</i>																	
07 Apr	N11E75	166	0120	02	Hax	001	A										
08 Apr	N13E64	164	0090	10	Cso	003	B										
09 Apr	N13E54	161	0120	15	Eso	004	B										
10 Apr	N13E43	159	0100	15	Eso	003	B										
11 Apr	N13E31	158	0080	14	Eso	005	B					1					
12 Apr	N14E19	156	0120	14	Cso	008	B										
13 Apr	N13E03	159	0090	13	Eao	007	B										
14 Apr	N13W11	160	0090	14	Eso	011	B										
15 Apr	N12W28	164	0120	05	Cso	008	B										
16 Apr	N12W42	165	0070	05	Cso	005	B										
17 Apr	N12W55	165	0050	04	Cso	003	B										
18 Apr	N12W70	166	0060	02	Hsx	001	A										
19 Apr	N12W84	167	0040	02	Hsx	001	A										
								0	0	0	1	0	0	0	0	0	

Crossed West Limb.

Absolute heliographic longitude: 159



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 9903</i>																		
08 Apr	N19E74	154	0060	07	Dso	003	B											
09 Apr	N19E61	154	0050	04	Cao	004	B										1	
10 Apr	N19E47	155	0060	04	Cso	004	B										1	
11 Apr	N19E34	155	0040	03	Cso	005	B										1	
12 Apr	N18E19	156	0030	04	Cro	004	B											
13 Apr	N18E06	156																
14 Apr	N15W02	151	0000	00	Axx	001	A											
15 Apr	N16W13	149	0010	06	Bxo	004	B											
16 Apr	N17W25	148	0010	01	Axx	002	A											
17 Apr	N17W38	148																
18 Apr	N17W51	148																
19 Apr	N17W64	148																
20 Apr	N17W77	148																
21 Apr	N17W90	148																
											0	0	0	2	1	0	0	0

Still on Disk.

Absolute heliographic longitude: 151

<i>Region 9905</i>																		
10 Apr	S17E04	198	0040	04	Cso	004	B											
11 Apr	S15W13	202	0040	05	Cao	007	B											
12 Apr	S15W25	200	0050	07	Dao	012	B											
13 Apr	S15W41	203	0060	08	Dao	006	B											
14 Apr	S14W55	204	0060	08	Dso	004	B											
15 Apr	S14W69	205	0110	08	Dso	008	B	1						1				
16 Apr	S15W83	206	0050	08	Dro	003	B											
											1	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 198



Region Summary - continued.

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			
<i>Region 9906</i>																		
11 Apr	S16E40	149	0080	05	Dso	009	B											
12 Apr	S16E26	149	0190	07	Dai	020	Bg	2				2						
13 Apr	S15E13	149	0470	10	Dkc	038	Bgd	1				2						
14 Apr	S15W02	151	0640	12	Eki	032	Bgd	1				4						
15 Apr	S15W14	150	0690	13	Eki	034	Bg		1			1						
16 Apr	S15W28	151	0590	13	Eki	027	Bgd					3						
17 Apr	S14W41	151	0650	13	Eki	026	Bgd		1			1			1			
18 Apr	S14W55	151	0770	15	Ekc	033	Bg					2						
19 Apr	S14W66	149	0850	15	Ekc	037	Bg	4				9						
20 Apr	S14W79	149	0680	13	Eac	027	Bg					1						
21 Apr	S14W90	147	0330	12	Eai	014	Bg				1		1					
								8	2	1	25	1	1	0	0			

Still on Disk.

Absolute heliographic longitude: 151

<i>Region 9907</i>																		
11 Apr	S04E74	115	0200	10	Dso	010	B											
12 Apr	S05E61	114	0380	13	Eai	014	Bg	2				3						
13 Apr	S04E46	116	0440	10	Dac	030	Bg	2				2						
14 Apr	S04E33	116	0330	10	Dai	025	B	4				7						
15 Apr	S04E21	115	0270	11	Eai	035	Bg											
16 Apr	S03E07	116	0170	11	Eao	023	B											
17 Apr	S03W07	117	0100	11	Eai	025	B											
18 Apr	S02W22	118	0070	07	Dao	016	B	1				1						
19 Apr	S03W32	115	0070	07	Dso	008	B											
20 Apr	S03W48	118	0070	06	Dao	005	B											
21 Apr	S03W63	120	0020	05	Cro	002	B											
								9	0	0	13	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 116

<i>Region 9908</i>																		
12 Apr	N05W25	200	0020	03	Cao	004	B											
13 Apr	N04W40	202	0060	05	Dso	007	B											
14 Apr	N05W54	203	0020	05	Cso	007	B											
15 Apr	N05W70	206	0030	03	Cro	004	B											
16 Apr	N05W83	206																
								0	0	0	0	0	0	0	0	0		

Crossed West Limb.

Absolute heliographic longitude: 200



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 9909

14 Apr	N06E70	079	0130	02	Hsx	001	A													
15 Apr	N11E56	080	0180	02	Hsx	001	A						1							
16 Apr	N11E42	081	0120	02	Hax	002	A													
17 Apr	N08E28	082	0100	03	Cso	003	B						1							
18 Apr	N08E15	081	0100	03	Cso	003	B						1							
19 Apr	N07E02	081	0120	04	Cso	004	B													
20 Apr	N07W10	080	0100	06	Cao	006	B													
21 Apr	N07W24	081	0050	02	Hsx	002	A													
													0	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 081

Region 9910

15 Apr	S21E50	086	0030	04	Bxo	005	B													
16 Apr	S20E37	086	0030	06	Cso	004	B													
17 Apr	S20E22	088	0060	08	Dao	008	B													
18 Apr	S20E07	089	0210	10	Dao	018	B													
19 Apr	S20W06	089	0210	10	Dao	017	B													
20 Apr	S20W18	088	0180	12	Eao	023	B													
21 Apr	S20W33	090	0100	11	Cao	013	B													
													0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 089

Region 9911

18 Apr	S13E23	073	0020	03	Bxo	004	B													
19 Apr	S13E11	072	0040	04	Cao	006	B													
20 Apr	S13W04	074	0030	06	Dso	008	B													
21 Apr	S13W17	074																		
													0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 074

Region 9912

18 Apr	N11E28	068	0050	04	Dso	004	B												
19 Apr	N09E15	068	0060	05	Dao	012	B												
20 Apr	N10E02	068	0200	06	Dao	026	B	1				2							
21 Apr	N10W12	069	0270	07	Dai	021	Bg					2							
								1	0	0	4	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 068



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 9913</i>																	
19 Apr	S15E23	060	0030	05	Bxo	006	B										
20 Apr	S16E10	060	0030	06	Cso	006	B										
21 Apr	S17W02	059	0010	05	Bxo	008	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 059																	
<i>Region 9914</i>																	
19 Apr	N04E72	011	0010	01	Axx	001	A										
20 Apr	N05E59	011	0040	05	Cao	004	B										
21 Apr	N04E44	013	0070	06	Cao	005	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 013																	
<i>Region 9915</i>																	
21 Apr	N11E54	003	0030	01	Hrx	001	A										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 003																	
<i>Region 9916</i>																	
21 Apr	S17E71	346	0150	06	Dao	004	B										
								0	0	0	0	0	0	0	0	0	0
Still on Disk.																	
Absolute heliographic longitude: 346																	

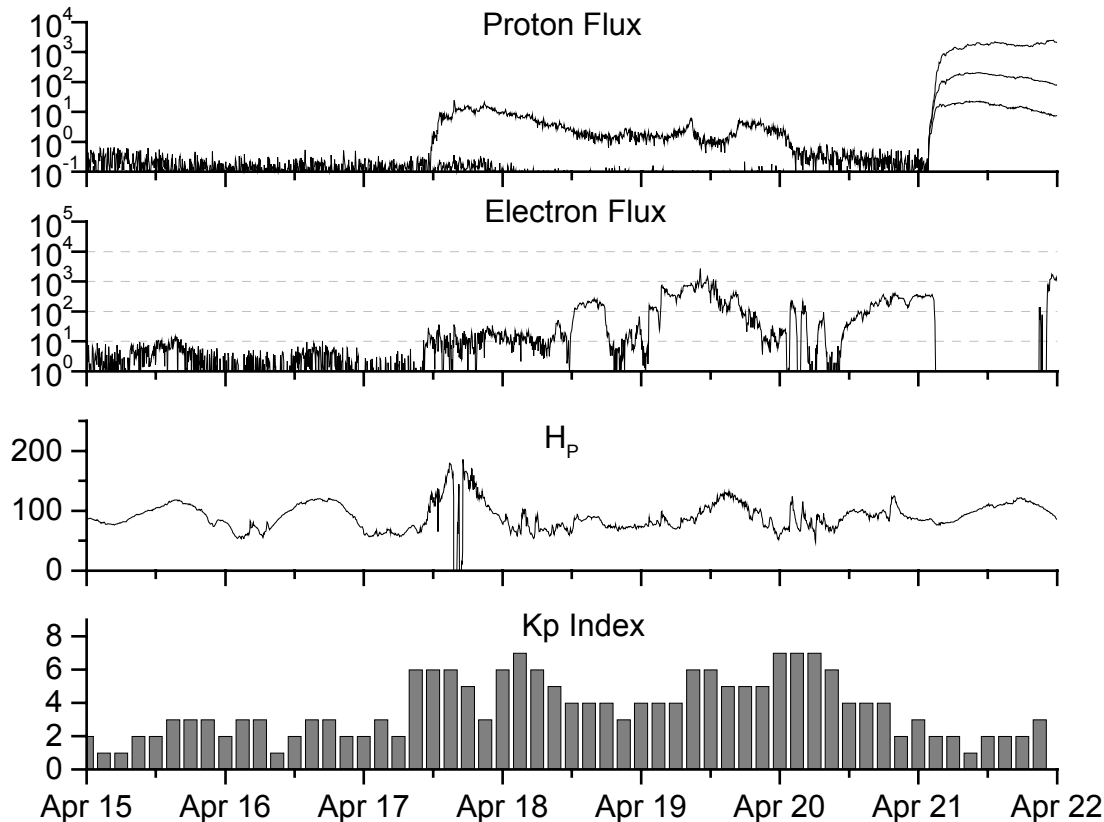


**Recent Solar Indices (preliminary)
of the observed monthly mean values**

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
2000									
April	193.4	125.5	0.65	176.3	120.8	184.2	180.5	15	15.0
May	188.8	121.6	0.64	173.1	119.0	184.5	180.0	15	15.0
June	190.3	124.9	0.66	172.0	118.7	179.8	179.7	15	15.1
July	236.7	169.1	0.71	173.0	119.7	204.7	180.2	21	14.8
August	166.6	130.5	0.78	171.8	118.6	163.1	179.5	16	14.2
September	157.9	109.9	0.70	169.0	116.2	182.1	177.1	18	14.2
October	138.9	100.1	0.72	166.2	114.4	167.7	175.6	18	14.6
November	149.9	106.5	0.71	162.7	112.7	178.8	173.6	17	14.6
December	146.4	104.5	0.71	160.8	112.1	173.6	172.0	08	14.4
2001									
January	142.7	95.1	0.67	156.3	108.8	166.7	168.8	08	13.8
February	131.0	80.1	0.61	151.4	104.2	147.3	165.8	06	13.3
March	166.7	114.2	0.69	154.0	104.9	177.7	167.9	17	12.9
April	163.6	108.2	0.66	159.4	107.7	178.3	171.7	18	12.7
May	135.1	97.3	0.72	163.1	108.8	148.7	174.8	12	12.5
June	196.7	134.0	0.68	167.2	109.9	173.7	178.8	12	12.4
July	124.6	82.2	0.66	172.1	111.8	131.3	183.9	11	12.4
August	159.4	106.8	0.67	176.7	113.8	163.2	188.8	13	12.5
September	229.1	150.7	0.66	178.8	114.3	233.3	191.3	12	12.3
October	197.4	125.6	0.64			208.2		18	
November	178.6	106.5	0.60			212.5		14	
December	217.5	131.8	0.61			236.6		08	
2002									
January	189.0	113.9	0.60			226.4		07	
February	194.5	108.0	0.56			205.1		09	
March	153.1	98.1	0.64			179.5		10	

NOTE: All smoothed values after June 1999 and monthly values after December 2000 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 22, RI= 158.5, occurred July 1989. *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 15 April 2002

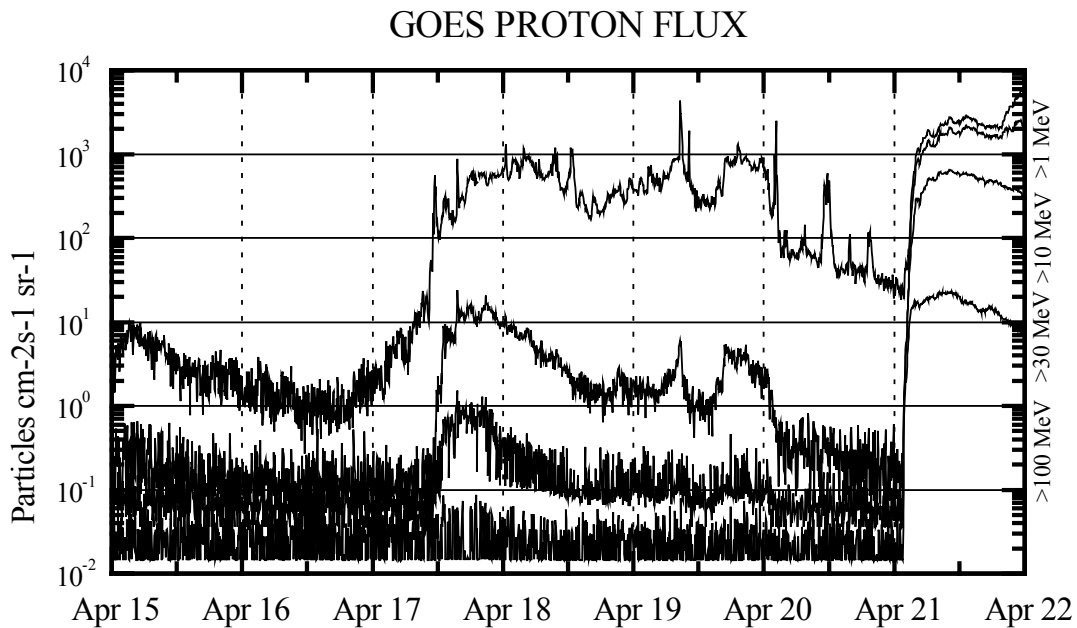
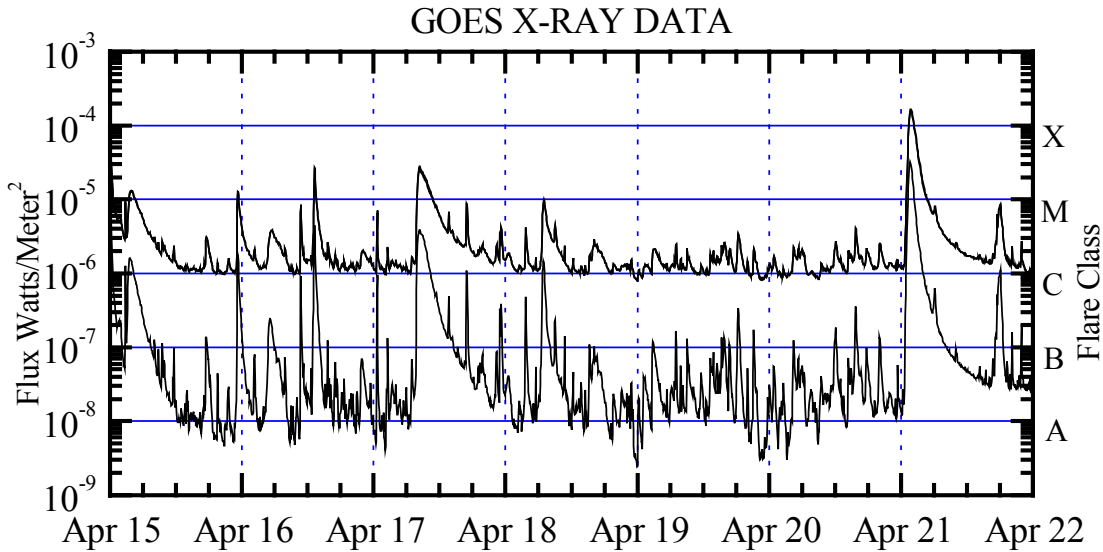
Protons plot contains the five-minute averaged integral proton flux (protons/cm²-sec -sr) as measured by GOES-8 (W75) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

Electrons plot contains the five-minute averaged integral electron flux (electrons/cm²-sec -sr) with energies greater than 2 MeV at GOES-8.

H_p 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.

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 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 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 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/cm²-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/cm²-sec-sr) at greater than 10 MeV.

