Space Weather Highlights
21 April - 27 April 2025

SWPC PRF 2591
28 April 2025

Solar activity reached moderate levels on 21 and 22 Apr due to M-class flare activity. Region 4062 (S03, L=69, class/area=Dki/300 on 18 Apr) produced an M1.9 flare at 21/1837 UTC and Region 4065 (S29, L=42, class/area=Dso/80 on 20 Apr) produced an M1.3 at 22/1049 UTC. Low levels were observed throughout the remainder of the period. No Earth-directed CMEs resulted from this week's activity.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 27 Apr, while normal to moderate levels prevailed throughout the remainder of the period.

Geomagnetic field activity reached G1 (Minor) storm levels on 21 Apr, and active levels on 22 Apr, due to positive polarity CH HSS influences. Active conditions were observed again on 24 Apr due to a prolonged bout of southward IMF. Quiet and quiet to unsettled levels were observed throughout the remainder of the week.

Space Weather Outlook
28 April - 24 May 2025

Solar activity is expected to be predominately low through the outlook period with a varying chance for M-class flare activity.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is likely to reach high levels on 28-30 Apr and 03-12 May. Normal to moderate levels are likely to prevail throughout the remainder of the period.

Geomagnetic field activity is likely to reach G1 (Minor) storm levels on 05-06 May due to negative polarity CH HSS influences, and again on 18 May due to positive polarity CH HSS influences. Periods of active conditions are likely on 28 Apr, 02, 07-10, and 16-17 May in response to CH HSS influences. Quiet and quiet to unsettled levels are expected to prevail throughout the remainder of the period.

Daily Solar Data

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10^{-6} hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
21 April	163	137	830	C1.0	2	1	0	4	1	0	0	0
22 April	163	142	610	C1.2	2	1	0	6	0	0	0	0
23 April	167	132	700	C1.0	6	0	0	9	0	0	0	0
24 April	170	152	600	C1.0	5	0	0	4	0	0	0	0
25 April	164	169	810	B9.0	4	0	0	1	0	0	0	0
26 April	156	172	530	B8.5	4	0	0	1	0	0	0	0
27 April	156	119	420	B8.9	5	0	0	2	0	0	0	0

Daily Particle Data

Date	Proton Fluence (protons/cm ^{2} -day -sr)		Electron Fluence (electrons/cm^2 -day -sr)
	>1 MeV	>10 MeV	>2MeV
21 April	1.5e+06	1.5e+04	1.5e+07
22 April	3.2e+06	1.5e+04	2.3e+07
23 April	2.6e+06	1.6e+04	2.9e+07
24 April	1.6e+06	1.6e+04	3.2e+07
25 April	6.4e+05	1.5e+04	3.9e+07
26 April	5.3e+05	1.6e+04	5.5e+07
27 April	9.4e+05	1.5e+04	4.6e+07

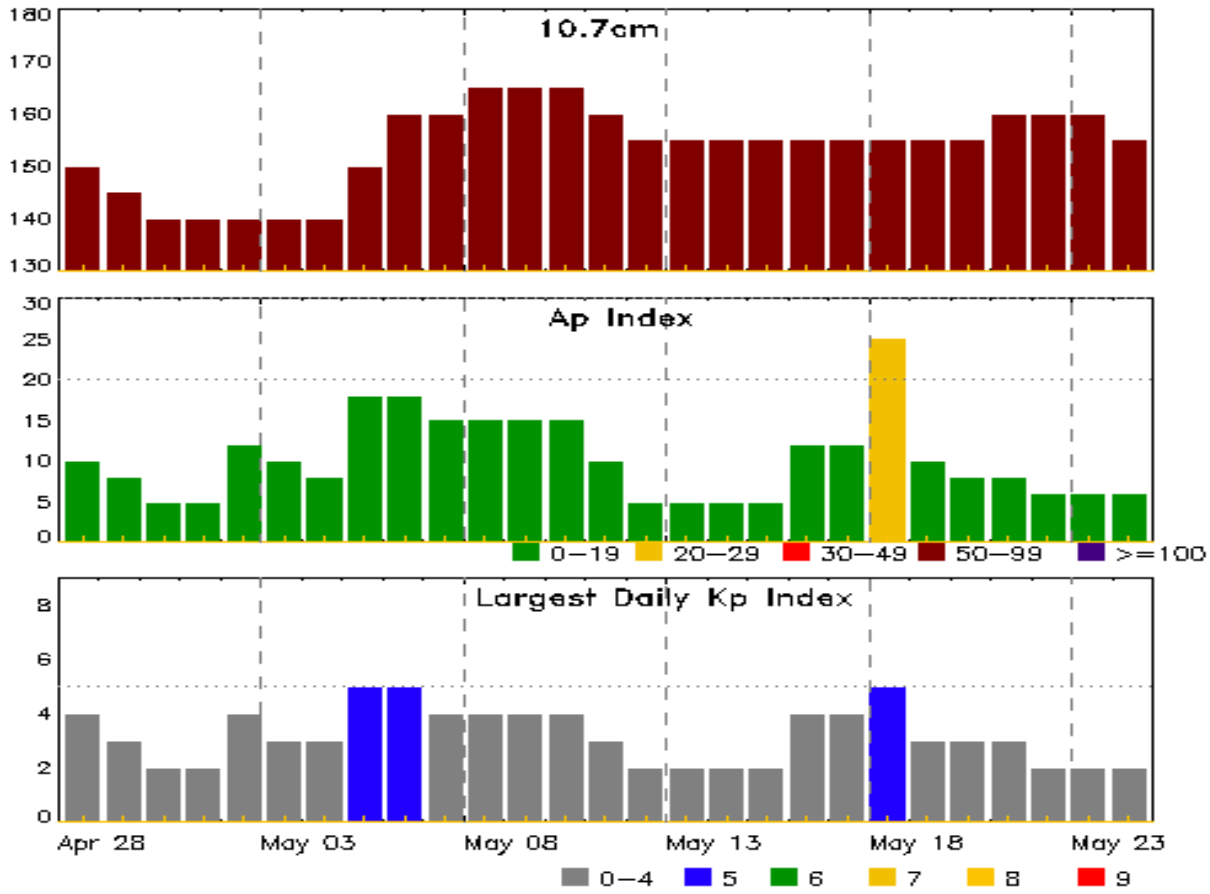
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
21 April	24	4-4-3-4-5-3-4-2	37	3-5-5-5-5-5-4-3	35	4-4-4-5-5-4-5-3
22 April	13	4-3-3-2-3-2-2-2	14	3-2-4-3-3-3-2-2	13	4-3-3-2-2-2-3-3
23 April	9	1-2-2-4-3-2-1-1	12	1-2-2-5-3-2-2-1	7	2-3-2-3-2-1-1-1
24 April	14	2-2-4-3-4-2-3-2	22	2-2-5-5-5-2-2-1	13	3-2-4-3-4-2-2-1
25 April	5	1-1-1-2-2-1-2-2	4	1-1-1-0-1-1-2-2	5	1-1-1-2-2-1-2-2
26 April	7	2-1-1-2-2-3-2-2	15	2-2-1-5-5-1-1-1	7	2-2-1-2-2-2-2-2
27 April	7	2-2-1-2-3-2-2-1	4	1-2-1-0-1-2-2-1	5	1-2-1-1-2-2-2-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
21 Apr 0148	WATCH: Geomagnetic Storm Category G2 predicted	
21 Apr 0218	WARNING: Geomagnetic K = 4	21/0218 - 1200
21 Apr 0225	ALERT: Geomagnetic K = 4	
21 Apr 0934	EXTENDED WARNING: Geomagnetic K = 4	21/0218 - 2359
21 Apr 1010	WARNING: Geomagnetic K = 5	21/1010 - 2359
21 Apr 1146	ALERT: Geomagnetic K = 5	
21 Apr 1354	WARNING: Geomagnetic K = 6	21/1353 - 1800
21 Apr 1354	ALERT: Geomagnetic K = 5	
21 Apr 2034	ALERT: Geomagnetic K = 5	
21 Apr 2356	EXTENDED WARNING: Geomagnetic K = 4	21/0218 - 22/1159
24 Apr 0656	WARNING: Geomagnetic K = 4	24/0655 - 1200
24 Apr 0709	ALERT: Geomagnetic K = 4	
24 Apr 1136	EXTENDED WARNING: Geomagnetic K = 4	24/0655 - 1800
24 Apr 1716	EXTENDED WARNING: Geomagnetic K = 4	24/0655 - 25/0900
27 Apr 1632	ALERT: Electron 2MeV Integral Flux >= 1000pfu	27/1605

Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
28 Apr	150	10	4	12 May	155	5	2
29	145	8	3	13	155	5	2
30	140	5	2	14	155	5	2
01 May	140	5	2	15	155	5	2
02	140	12	4	16	155	12	4
03	140	10	3	17	155	12	4
04	140	8	3	18	155	25	5
05	150	18	5	19	155	10	3
06	160	18	5	20	155	8	3
07	160	15	4	21	160	8	3
08	165	15	4	22	160	6	2
09	165	15	4	23	160	6	2
10	165	15	4	24	155	6	2
11	160	10	3				

Energetic Events

	Time			X-ray		Optical Information			Peak Radio Flux		Sweep Freq Intensity	
Date	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	245	2695	II	IV
21 Apr	1824	1837	1841	M1.9		0.009	1N	N01W14	4062			
22 Apr	0838	1049	1134	M1.3		0.063	SF	S30E09	4065	210		

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
21 Apr	0010	0031	0054	C3.9	SF	N12E20	4064
21 Apr	0631	0642	0651	C2.1			4063
21 Apr	1348	1350	1357		SF	N04W57	4063
21 Apr	1409	1409	1412		SF	N06W55	4063
21 Apr	1418	1420	1427		SF	N04W55	4063
21 Apr	1824	1837	1841	M1.9	1N	N01W14	4062
22 Apr	0054	0100	0107	C9.9			
22 Apr	0803	0829	A0832	M1.3	SF	S30E09	4063
22 Apr	B0938	U0941	A0945		SF	S14W60	
22 Apr	1100	U1100	1112		SF	N12E03	4064
22 Apr	1504	1506	1509		SF	S08E16	4069
22 Apr	1851	1857	1900	C2.6	SF	S01W29	4062
22 Apr	1938	1954	1952		SF	S28E51	4068
23 Apr	0229	0234	0241	C2.0			
23 Apr	0914	0921	0924	C1.4			4070
23 Apr	0946	0955	1002		SF	S14E35	4070
23 Apr	1030	U1043	1111		SF	S14E34	4070
23 Apr	1212	1216	1221		SF	S14E33	4070
23 Apr	B1315	1437	1620		SF	S13E32	4070
23 Apr	1438	1444	1449	C3.9	SF	N10W13	4064
23 Apr	1516	1454	1516		SF	N11W13	4064
23 Apr	1651	1652	1659		SF	S06E01	4069
23 Apr	2021	2029	2036	C1.7	SF	N12W17	4064
23 Apr	2152	2159	2208	C1.7	SF	N11W18	4064
23 Apr	2158	2159	2202		SF	S11E27	4070
23 Apr	2257	2308	2315	C1.7			4070
23 Apr	2315	2328	2348	C2.3			4070
24 Apr	0020	0028	0034	C3.8	SN	N15W12	4064
24 Apr	0037	0037	0044		SF	S01W16	4067

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
24 Apr	0048	0050	0053		SF	S01W15	4067
24 Apr	0136	0144	0151	C3.0			4070
24 Apr	0231	0237	0239	C3.0			4067
24 Apr	0605	0620	0646		SF	S13E22	4070
24 Apr	1418	1434	1456	C2.4			4064
24 Apr	1532	1541	1544	C2.0			4064
25 Apr	0357	0405	0409	C3.0			4077
25 Apr	1127	1134	1145	C1.2			4077
25 Apr	1324	1333	1352	C1.4	SF	N11E32	4073
25 Apr	1954	2003	2012	C1.3			4073
26 Apr	0733	0742	0747	C1.3			4064
26 Apr	0747	0754	0757	C1.3			4064
26 Apr	0955	1007	1026	C1.6			4072
26 Apr	1056	1122	1134	C1.7			4064
26 Apr	2122	2123	2127		SF	S15W14	4070
27 Apr	0818	0828	0839	C1.3			
27 Apr	1717	1724	1730	C1.4	SF	S14W26	4070
27 Apr	1837	1849	1904	C2.1	SF	N08W72	4064
27 Apr	2220	2229	2238	C1.5			
27 Apr	2238	2244	2246	C2.1			4064

Region Summary

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4060												
10 Apr	N07E57	142	100	6	Dao	2	B	2							
11 Apr	N07E50	136	140	6	Cao	4	B				2				
12 Apr	N09E34	139	130	4	Dso	7	B	1			2				
13 Apr	N09E21	139	140	7	Dao	6	BG	1							
14 Apr	N08E07	138	140	8	Dai	12	BG								
15 Apr	N08W03	135	180	9	Dai	14	BG				2				
16 Apr	N08W19	138	140	8	Dai	11	BG								
17 Apr	N08W31	138	120	8	Cao	8	BD	1							
18 Apr	N08W42	135	80	4	Cao	5	B	1							
19 Apr	N07W55	135	70	4	Cao	4	B	1			3				
20 Apr	N08W69	136	40	2	Cao	3	B				1				
21 Apr	N08W82	136	20	2	Hrx	2	A								
								7	0	0	10	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 135

			Region 4062												
15 Apr	S02E61	71	180	4	Dao	2	B	1							
16 Apr	S02E53	68	250	7	Dko	3	BG	2			1				
17 Apr	S03E38	69	280	5	Dki	18	BG	3			1				
18 Apr	S03E24	69	300	7	Dki	13	BG	1			1				
19 Apr	S03E11	69	280	6	Dki	12	BG								
20 Apr	S03W04	71	270	5	Dki	11	BG								
21 Apr	S03W17	71	280	6	Dki	15	B		1			1			
22 Apr	S02W32	72	130	6	Dai	15	B	1			1				
23 Apr	S03W45	71	140	4	Dai	12	B								
24 Apr	S03W57	70	70	3	Hax	3	A								
25 Apr	S03W72	73	30	3	Hsx	3	A								
26 Apr	S01W85	73	20	1	Hsx	1	A								
								8	1	0	4	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 71

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4063												
16 Apr	N05E08	111	10	4	Bxo	2	B								
17 Apr	N05W04	111	10	4	Bxo	2	B								
18 Apr	N06W19	113	plage												
19 Apr	N05W35	115	10	4	Bxo	3	B				1				
20 Apr	N04W49	116	10	3	Bxo	3	B	1			1				
21 Apr	N04W63	117	30	6	Cro	9	B	1			3				
22 Apr	N05W79	119	10	3	Cro	2	B		1						
								2	1	0	5	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 111

			Region 4064												
16 Apr	S08E74	45	80	7	Dao	3	B								
17 Apr	N11E60	47	200	8	Dai	8	B	1							
18 Apr	N11E45	47	350	9	Dki	9	B	2							
19 Apr	N11E32	48	350	9	Dki	9	B								
20 Apr	N11E18	49	330	8	Dki	10	B	1			1				
21 Apr	N11E07	47	340	11	Eki	19	B	1			1				
22 Apr	N11W07	47	250	11	Ehi	18	B				1				
23 Apr	N11W18	45	210	11	Eai	16	B	2			4				
24 Apr	N11W32	46	200	11	Eai	12	B	3			1				
25 Apr	N11W45	46	300	9	Dki	12	B								
26 Apr	N12W59	47	180	6	Dso	5	B	3							
27 Apr	N12W72	47	100	6	Dso	4	B	2			1				
								15	0	0	9	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 47

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4065												
17 Apr	S30E63	44	30	2	Hsx	1	A								
18 Apr	S30E47	45	30	1	Hsx	1	A								
19 Apr	S30E36	44	70	3	Dso	6	B	1			1				
20 Apr	S29E25	42	80	3	Dao	4	B	1							
21 Apr	S31E12	42	70	4	Cso	3	B								
22 Apr	S31W02	43	70	2	Hsx	1	A				1				
23 Apr	S31W14	41	70	3	Cso	3	B								
24 Apr	S31W27	41	40	1	Hsx	1	A								
25 Apr	S31W41	42	40	1	Hsx	1	A								
26 Apr	S31W54	42	30	1	Hsx	1	A								
27 Apr	S31W65	40	30	1	Hsx	1	A								
								2	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 43

			Region 4066												
17 Apr	S05E49	58	40	6	Cai	9	B	1							
18 Apr	S04E33	59	30	7	Cao	7	B	1							
19 Apr	S04E21	59	20	5	Cro	5	B								
20 Apr	S04E08	59	20	2	Cso	4	B								
21 Apr	S05W04	58	10	2	Axx	4	A								
22 Apr	S05W19	60	plage												
23 Apr	S05W33	59	plage												
24 Apr	S05W44	58	10	1	Axx	1	A								
25 Apr	S05W59	60	plage												
26 Apr	S05W74	62	plage												
27 Apr	S05W89	64	plage												
								2	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 58

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4067												
18 Apr	S02E55	38	50	6	Cso	7	B								
19 Apr	S03E42	38	40	6	Cso	5	B								
20 Apr	S03E28	39	40	6	Cso	3	B								
21 Apr	S03E14	40	20	9	Cro	2	B								
22 Apr	S03E01	39	10	9	Bxo	2	B								
23 Apr	S03W19	42	plage												
24 Apr	S03W27	40	10	1	Axx	1	A	1			2				
25 Apr	S03W42	43	plage												
26 Apr	S03W55	42	plage												
27 Apr	S04W68	43	plage												
								1	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 39

			Region 4068												
20 Apr	S06E82	347	plage					1	1						
21 Apr	S26E62	352	60	4	Dso	3	B								
22 Apr	S26E46	354	70	3	Dso	3	B				1				
23 Apr	S26E35	352	60	3	Dso	3	B								
24 Apr	S26E22	352	50	3	Dso	2	B								
25 Apr	S26E08	353	20	3	Hax	1	A								
26 Apr	S26W05	353	10	1	Axx	1	A								
27 Apr	S25W17	352	10	1	Hrx	1	A								
								1	1	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 353

			Region 4069												
22 Apr	S08E07	33	20	3	Cao	4	B				1				
23 Apr	S08W05	31	60	7	Dao	5	B				1				
24 Apr	S09W17	31	40	7	Dao	5	B								
25 Apr	S09W31	32	30	7	Dro	5	B								
26 Apr	S09W45	33	20	3	Cso	3	B								
27 Apr	S09W59	34	10	1	Axx	1	A								
								0	0	0	2	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 31

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4070												
22 Apr	S12E38	2	40	4	Cao	4	B								
23 Apr	S12E24	2	70	7	Dai	9	BG	3			4				
24 Apr	S12E14	2	90	6	Dai	7	B	1			1				
25 Apr	S12W00	1	140	6	Dai	7	B								
26 Apr	S12W14	2	110	10	Dsi	6	B				1				
27 Apr	S12W28	3	110	10	Dso	11	B	1			1				
								5	0	0	7	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 1

			Region 4071												
22 Apr	S13W69	109	10	5	Bxo	3	B								
23 Apr	S13W89	112	10	2	Bxo	3	B								
24 Apr	S13W99	115	10	2	Bxo	3	B								
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 109

			Region 4072												
23 Apr	S18E62	324	80	2	Hsx	1	A								
24 Apr	S18E52	322	50	2	Hsx	1	A								
25 Apr	S18E38	323	60	2	Hsx	1	A								
26 Apr	S19E25	323	50	1	Hsx	4	A	1							
27 Apr	S19E11	324	50	2	Hsx	4	A								
								1	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 324

			Region 4073												
24 Apr	N12E40	334	30	4	Dri	6	B								
25 Apr	N12E26	335	30	4	Dri	6	B	2			1				
26 Apr	N11E13	336	10	4	Bxo	32	B								
27 Apr	N11W00	335	10	5	Bxo	2	B								
								2	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 335

Region Summary - continued

	Location		Sunspot Characteristics					Flares							
		Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical				
Date	Lat CMD	Lon	10^{-6} hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4
			Region 4074												
25 Apr	S20W59	60	20	3	Cri	4	B								
26 Apr	S20W73	61	20	3	Cri	4	B								
27 Apr	S20W87	62	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 60

			Region 4075												
25 Apr	S11E48	313	10	3	Bxo	4	B								
26 Apr	S11E34	314	plage												
27 Apr	S11E20	315	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 315

			Region 4076												
25 Apr	N06E59	302	80	2	Hsx	1	A								
26 Apr	N05E45	303	60	1	Hsx	1	A								
27 Apr	N05E30	305	80	2	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 305

			Region 4077												
25 Apr	S17E62	299	50	6	Dao	4	B	2							
26 Apr	S17E47	301	20	3	Cao	4	B								
27 Apr	S16E32	303	20	3	Hrx	4	A								
								2	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 303

Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)

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Notice: The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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