

Space Weather Highlights
14 April - 20 April 2025

SWPC PRF 2590
21 April 2025

Solar activity reached moderate levels due to M-class flare activity on 14-15, 18 and 20 Apr. The largest event of the period was an M4.4 flare at 18/2350 UTC from an unseen source beyond the SE limb. No Earth-directed CMEs resulted from this week's solar activity.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 14 Apr, with normal to moderate levels observed over 15-20 Apr.

Geomagnetic field activity began the period at quiet to active levels in response to negative polarity CH HSS influences on 14 Apr. Periods of G1-G2 (Minor-Moderate) storming was observed on 15 Apr, with periods of G1-G4 (Minor-Severe) storming observed on 16 Apr, due to the passage of a CME that left the Sun on 13 Apr. Remnant CME influences and bouts of southward IMF persisted on 17-18 Apr with quiet to active levels observed. Quiet to active levels were observed on 19 Apr, and quiet to G1 (Minor) levels were observed on 20 Apr, in response to prolonged periods of southward Bz.

Space Weather Outlook
21 April - 17 May 2025

Solar activity is expected to be predominately low with a varying chance for M-class (R1-R2/Minor-Moderate) flares throughout the forecast period.

No proton events are expected at geosynchronous orbit, barring significant flare activity.

The greater than 2 MeV electron flux at geosynchronous orbit is likely to reach high levels on 21-28 Apr, and 03-12 May. Normal to moderate levels are expected to prevail throughout the remainder of the period.

Geomagnetic field activity is likely to reach G2 (Moderate) levels on 22-23 Apr, and G1 (Minor) levels on 24-25 Apr, due to the anticipated influence of a positive polarity CH HSS. Periods of G1 storms are likely on 01 May, and periods of G2 storms are likely on 02 May, due negative polarity CH HSS influences. The geomagnetic field is likely to reach G1 storm levels again over 05-11 May due to the influences of another negative polarity CH HSS.



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
14 April	152	86	1070	C1.8	9	2	0	1	0	0	0	0
15 April	153	58	410	C1.4	4	2	0	2	0	0	0	0
16 April	148	70	500	C1.0	4	0	0	1	0	0	0	0
17 April	151	118	710	B8.7	6	0	0	1	0	0	0	0
18 April	156	113	870	C1.0	5	1	0	1	0	0	0	0
19 April	157	114	840	C1.0	2	0	0	5	0	0	0	0
20 April	156	108	790	C1.0	4	1	0	3	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	
14 April	5.8e+05	1.5e+04	5.6e+07	
15 April	6.7e+06	1.5e+04	5.9e+07	
16 April	3.3e+06	1.4e+04	1.1e+07	
17 April	1.6e+06	1.4e+04	1.2e+07	
18 April	1.7e+05	1.4e+04	1.1e+07	
19 April	2.6e+05	1.4e+04	1.4e+07	
20 April	3.1e+05	1.5e+04	2.3e+07	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
14 April	14	3-4-3-2-3-2-2-3	28	4-6-4-4-3-4-2-3	18	3-4-3-2-2-3-3-4
15 April	13	3-2-2-1-2-3-1-5	19	2-2-2-3-4-3-5-4	34	3-2-2-2-2-5-6-6
16 April	43	5-3-3-4-6-4-6-5	63	3-3-3-4-7-7-7-3	77	5-3-3-5-7-6-8-5
17 April	11	2-4-2-2-3-3-1-2	7	2-4-1-1-2-1-1-1	11	3-4-2-2-3-2-1-2
18 April	11	3-4-2-2-3-2-1-2	15	3-3-3-3-3-4-2-2	13	3-4-3-2-2-2-2-3
19 April	18	4-3-3-2-4-3-2-4	49	4-3-7-6-5-5-2-4	20	4-3-4-3-3-3-2-4
20 April	11	4-1-2-1-2-2-3-3	13	3-2-2-4-3-2-3-2	48	5-3-3-2-2-1-3-2



Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
14 Apr 0033	WARNING: Geomagnetic K = 4	14/0031 - 0900
14 Apr 0439	ALERT: Geomagnetic K = 4	
14 Apr 0441	WARNING: Geomagnetic K = 5	14/0441 - 0900
14 Apr 0512	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	05/1225
14 Apr 0856	EXTENDED WARNING: Geomagnetic K = 4	14/0031 - 1500
14 Apr 2301	WARNING: Geomagnetic K = 4	14/2300 - 15/1200
14 Apr 2302	ALERT: Geomagnetic K = 4	
15 Apr 1116	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	05/1225
15 Apr 1524	WATCH: Geomagnetic Storm Category G3 predicted	
15 Apr 1651	WARNING: Geomagnetic Sudden Impulse expected	15/1729 - 1759
15 Apr 1707	WARNING: Geomagnetic K = 4	15/1705 - 16/1200
15 Apr 1729	ALERT: Geomagnetic K = 4	
15 Apr 1731	WARNING: Geomagnetic K = 5	15/1730 - 16/0600
15 Apr 1732	ALERT: Geomagnetic K = 5	
15 Apr 1850	WARNING: Geomagnetic K = 6	15/1900 - 16/0600
15 Apr 1859	ALERT: Geomagnetic K = 5	
15 Apr 1952	ALERT: Geomagnetic K = 6	
15 Apr 2113	SUMMARY: Geomagnetic Sudden Impulse	15/1859
15 Apr 2204	ALERT: Geomagnetic K = 5	
15 Apr 2229	ALERT: Geomagnetic K = 6	
16 Apr 0134	ALERT: Geomagnetic K = 5	
16 Apr 0535	EXTENDED WARNING: Geomagnetic K = 5	15/1730 - 16/1500
16 Apr 0535	EXTENDED WARNING: Geomagnetic K = 4	15/1705 - 16/1800
16 Apr 1200	ALERT: Geomagnetic K = 5	
16 Apr 1238	EXTENDED WARNING: Geomagnetic K = 5	15/1730 - 16/2100
16 Apr 1239	EXTENDED WARNING: Geomagnetic K = 4	15/1705 - 17/0000
16 Apr 1307	WARNING: Geomagnetic K = 6	16/1315 - 2100
16 Apr 1313	ALERT: Geomagnetic K = 5	

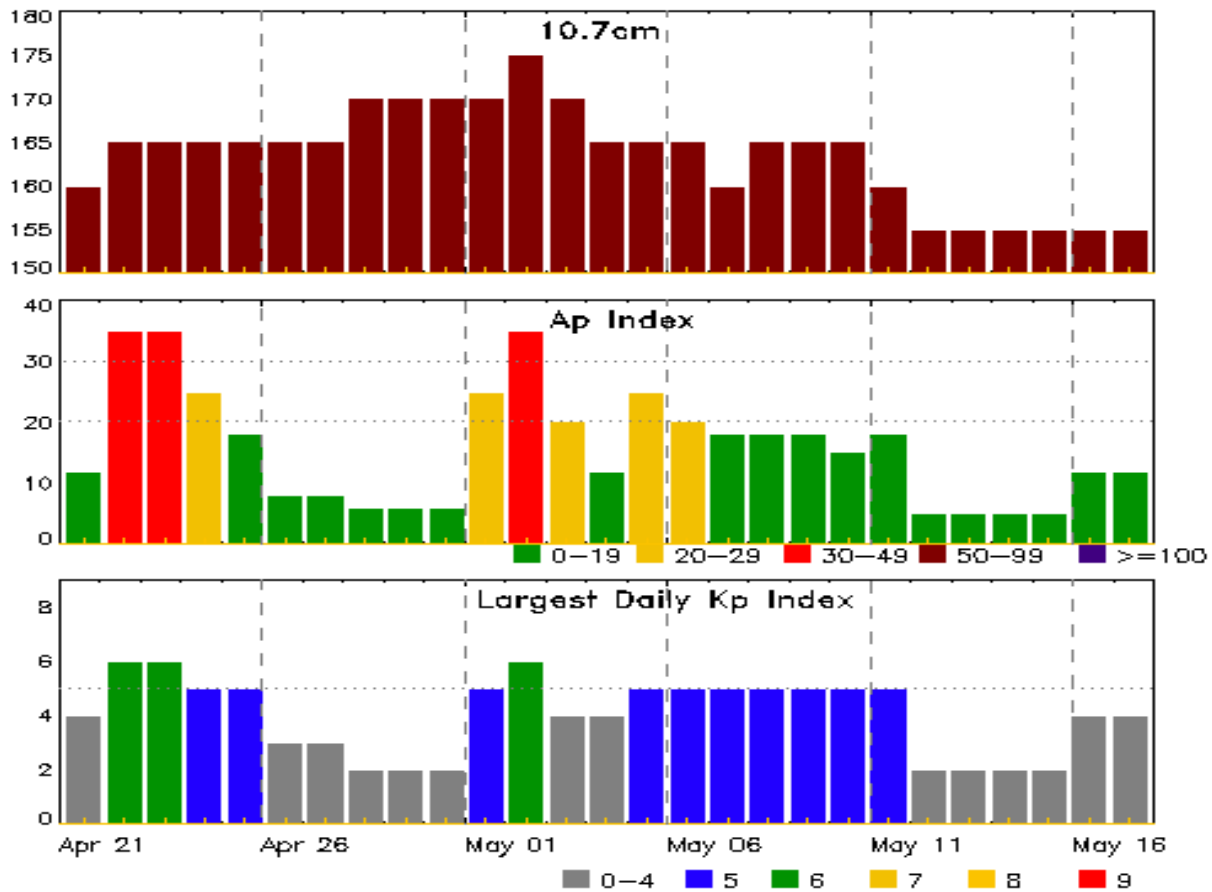


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
16 Apr 1324	ALERT: Geomagnetic K = 6	
16 Apr 1325	WARNING: Geomagnetic K \geq 7	16/1325 - 1800
16 Apr 1424	ALERT: Geomagnetic K = 7	
16 Apr 1526	ALERT: Geomagnetic K = 5	
16 Apr 1644	ALERT: Geomagnetic K = 6	
16 Apr 1832	ALERT: Geomagnetic K = 5	
16 Apr 1845	ALERT: Geomagnetic K = 6	
16 Apr 1852	EXTENDED WARNING: Geomagnetic K = 5	15/1730 - 17/0300
16 Apr 1852	EXTENDED WARNING: Geomagnetic K = 6	16/1315 - 17/0000
16 Apr 1853	EXTENDED WARNING: Geomagnetic K = 4	15/1705 - 17/1200
16 Apr 1931	WARNING: Geomagnetic K \geq 7	16/1930 - 17/0000
16 Apr 1932	ALERT: Geomagnetic K = 7	
16 Apr 2054	ALERT: Geomagnetic K = 8	
16 Apr 2140	ALERT: Geomagnetic K = 5	
16 Apr 2313	EXTENDED WARNING: Geomagnetic K = 6	16/1315 - 17/0600
16 Apr 2313	EXTENDED WARNING: Geomagnetic K = 5	15/1730 - 17/0900
17 Apr 1012	EXTENDED WARNING: Geomagnetic K = 4	15/1705 - 17/1800
18 Apr 0152	WARNING: Geomagnetic K = 4	18/0152 - 1200
18 Apr 0402	ALERT: Geomagnetic K = 4	
18 Apr 0448	WARNING: Geomagnetic K = 5	18/0447 - 1200
19 Apr 0007	ALERT: Type II Radio Emission	18/2345
19 Apr 0219	WARNING: Geomagnetic K = 4	19/0218 - 1500
19 Apr 0227	ALERT: Geomagnetic K = 4	
19 Apr 1455	EXTENDED WARNING: Geomagnetic K = 4	19/0218 - 2359
19 Apr 2047	WATCH: Geomagnetic Storm Category G2 predicted	
20 Apr 0006	WARNING: Geomagnetic K = 4	20/0005 - 1200
20 Apr 0038	WARNING: Geomagnetic K = 5	20/0038 - 1200
20 Apr 0041	ALERT: Geomagnetic K = 4	
20 Apr 0056	ALERT: Geomagnetic K = 5	



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
21 Apr	160	12	4	05 May	165	25	5
22	165	35	6	06	165	20	5
23	165	35	6	07	160	18	5
24	165	25	5	08	165	18	5
25	165	18	5	09	165	18	5
26	165	8	3	10	165	15	5
27	165	8	3	11	160	18	5
28	170	6	2	12	155	5	2
29	170	6	2	13	155	5	2
30	170	6	2	14	155	5	2
01 May	170	25	5	15	155	5	2
02	175	35	6	16	155	12	4
03	170	20	4	17	155	12	4
04	165	12	4				



Energetic Events

Date	Time			X-ray		Optical Information			Peak		Sweep Freq	
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux		II	IV
									245	2695		
14 Apr	0600	0605	0611	M1.4	0.009				4055			
14 Apr	0636	0650	0658	M4.2	0.002		SF	N06W82	4055			
15 Apr	1004	1020	1028	M1.5	0.012							
15 Apr	1757	1813	1827	M1.3	0.019							
18 Apr	2308	2350	0015	M4.4	0.088						1	
20 Apr	1137	1211	1259	M1.0	0.001							

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location	Rgn
						Lat CMD	#
14 Apr	0014	0020	0030	C6.4			4055
14 Apr	0438	0449	0456	C5.0			4055
14 Apr	0600	0605	0611	M1.4			4055
14 Apr	0636	0650	0658	M4.2	SF	N06W82	4055
14 Apr	0741	0748	0753	C3.9			
14 Apr	1220	1232	1241	C5.5			4055
14 Apr	1443	1450	1459	C3.2			4055
14 Apr	1530	1540	1544	C4.9			4055
14 Apr	1833	1842	1848	C6.2			4055
14 Apr	1944	2000	2015	C6.8			4055
14 Apr	2232	2240	2245	C2.7			4055
15 Apr	0135	0141	0146	C3.0			4055
15 Apr	0855	U0858	0905		SF	N06E06	4060
15 Apr	0919	0934	0942	C4.4			4055
15 Apr	1004	1020	1028	M1.5			
15 Apr	1342	1347	1352	C3.2			
15 Apr	1757	1813	1827	M1.3			
15 Apr	2008	2020	2049	C3.1			4062
15 Apr	2130	2132	2135		SF	N07W06	4060
16 Apr	0418	0439	0504	C8.1			
16 Apr	1223	1234	1239	C2.4			
16 Apr	1504	1508	1513	C1.7	SF	S00E56	4062
16 Apr	2341	2354	0006	C3.1	SF	S05E58	4062
17 Apr	0458	0505	0508	C1.5			4060
17 Apr	0932	0946	0952	C2.8			4062



Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
17 Apr	1401	1405	1411	C2.5			4062
17 Apr	1411	1422	1434	C4.6			4064
17 Apr	2144	2153	2200	C1.5			4066
17 Apr	2200	2204	2206	C2.1			4062
18 Apr	0410	0422	0429	C2.2			4060
18 Apr	0551	0601	0614	C1.8	SF	N01E35	4062
18 Apr	1203	1212	1220	C1.6			4066
18 Apr	2111	2117	2124	C1.4			4064
18 Apr	2148	2152	2156	C2.6			4064
18 Apr	2308	2350	0015	M4.4			
19 Apr	0815	0828	0834		SF	N04W25	4063
19 Apr	1106	1114	1120	C1.5	SF	N06W48	4060
19 Apr	B1602	U1602	1606		SF	N08W49	4060
19 Apr	1623	1628	1632	C4.3	SF	S31E45	4065
19 Apr	1636	1639	1649		SF	N08W49	4060
20 Apr	0620	0623	0626	C2.0			4065
20 Apr	0750	0757	0806	C2.2			
20 Apr	1137	1211	1259	M1.0			
20 Apr	1338	1340	1349		SF	N06W65	4060
20 Apr	1623	1628	1633	C1.7	SF	N13E31	4064
20 Apr	1702	1718	1734	C4.3	SF	N05W43	4063



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
Region 4055															
05 Apr	N09E34	231	10	5	Cro	2	B								
06 Apr	N09E21	231	10	2	Axx	2	A								
07 Apr	N08E07	232	20	5	Cao	8	B								
08 Apr	N08W07	233	30	6	Cro	7	B								
09 Apr	N08W22	234	30	8	Cro	9	BG	4					1		
10 Apr	N08W36	235	120	8	Dai	14	BG	3			6				
11 Apr	N08W51	237	360	11	Dkc	15	BGD	9	2		17	1			
12 Apr	N04W64	237	740	12	Ekc	17	BGD	8	7		6	2			
13 Apr	N07W75	235	820	13	Ekc	14	BGD	6	10		3	4			
14 Apr	N07W92	237	820	13	Ekc	14	BGD	8	2		1				
								38	21	0	33	8	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 232

Region 4056

06 Apr	S05E69	183	50	2	Hsx	1	A								
07 Apr	S07E58	181	60	1	Hsx	1	A								
08 Apr	S07E45	181	60	2	Hsx	1	A								
09 Apr	S07E31	181	70	2	Hsx	1	A								
10 Apr	S07E17	182	70	2	Hsx	1	A								
11 Apr	S06E04	182	50	2	Hsx	1	A								
12 Apr	S08W09	182	60	2	Cso	3	B								
13 Apr	S08W24	184	60	2	Hsx	1	A								
14 Apr	S09W36	181	60	2	Hsx	1	A								
15 Apr	S09W48	180	40	1	Hsx	1	A								
16 Apr	S07W62	181	20	1	Hsx	1	A								
17 Apr	S07W74	181	30	3	Cso	2	B								
18 Apr	S07W87	179	30	1	Hrx	1	A								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 182



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares							
	Lat CMD	Helio	Area 10 ⁻⁶ hemi. (helio)	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical				
		Lon						C	M	X	S	1	2	3	4

Region 4057

07 Apr	N07E54	185	10	1	Axx	2	A								
08 Apr	N08E41	185	10	1	Axx	2	A	1			1				
09 Apr	N08E27	185	10		Axx	1	A								
10 Apr	N08E13	186	plage												
11 Apr	N09W00	186	plage												
12 Apr	N09W12	185	plage												
13 Apr	N09W26	186	plage												
14 Apr	N09W40	186	plage												
15 Apr	N09W54	187	plage												
16 Apr	N09W68	188	plage												
17 Apr	N09W82	189	plage												
								1	0	0	1	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 186

Region 4058

09 Apr	N18W25	237	30	5	Dao	4	B								
10 Apr	N18W40	239	50	8	Dao	8	B								
11 Apr	N17W53	239	60	8	Cso	7	B								
12 Apr	N13W65	238	70	6	Dao	7	B								
13 Apr	N17W79	239	50	2	Cao	4	B								
14 Apr	N16W90	236	40	3	Cao	7	B								
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 237



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

Region 4059

09 Apr	N11E55	157	10	1	Hrx	1	A								
10 Apr	N11E39	160	10	1	Cro	1	B								
11 Apr	N13E27	159	10	3	Bxo	2	B								
12 Apr	N13E13	160	plage												
13 Apr	N13W01	161	plage												
14 Apr	N13W15	161	plage												
15 Apr	N13W29	162	plage												
16 Apr	N13W43	163	plage												
17 Apr	N13W57	164	plage												
18 Apr	N13W71	165	plage												
19 Apr	N13W85	165	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 161

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				
								7	0	0	10	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 135



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

Region 4061

11 Apr	N17E10	176	10	3	Bxo	3	B								
12 Apr	N17W04	177	20	3	Dso	5	B								
13 Apr	N19W15	175	30	4	Cso	5	B								
14 Apr	N18W29	175	10	3	Bxo	2	B								
15 Apr	N18W45	177	10	1	Axx	1	A								
16 Apr	N18W59	179	plage												
17 Apr	N18W73	180	plage												
18 Apr	N18W87	181	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 177

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								
								7	0	0	3	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 71

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				
								1	0	0	2	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 111



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 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				
								4	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 49

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							
								2	0	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 42

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								
								2	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 59

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								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 39



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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Current

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