Space Weather Highlights
23 June - 29 June 2025

SWPC PRF 2600
30 June 2025

Solar activity was at low levels through the week. The largest flare was a C5.0 at 23/1223 UTC from Region 4115 (N21, L=019, class/area Dso/180 on 12 Jun). Regions 4117(S14, L=303, class/area Dai/210 on 19 Jun), 4118 (S12, L=293, class/area Dai/120 on 23 Jun), 4120 (N07, L=298, class/area Dai/090 on 26 Jun) and 4122 (N13, L=219, class/area Dai/140 on 28 Jun) were the largest regions on the disk this week, however only 4118 and 4120 had beta-gamma magnetic classifications briefly. Other activity included a C4.0/1f flare at 28/1954 UTC from Region 4126 (N07, L=261, class/area Cro/020 on 28 Jun). An associated, faint, partial-halo CME was observed at 28/2112 UTC in SOHO/LASCO C2 imagery. Modelling of the event showed an arrival early on 02 Jul.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels on 23-25 Jun and again on 27-29 Jun with a peak flux of 6,350 pfu observed at 29/1600 UTC.

Geomagnetic field activity ranged from quiet to G1 (Minor) storming. Solar wind parameters began the period enhanced but waning under positive polarity CH HSS influence. Solar wind speeds decreased from approximately 400 km/s by early on 24 Jun. At 24/0930 UTC, a solar sector boundary crossing was observed as the solar wind transitioned into a negative sector. By early on 25 Jun, a CIR preceding a negative polarity CH HSS was observed. Total field began to increase early on 25 Jul reaching a maximum of 16 nT at 25/2010 UTC followed by an increase in solar wind speed mostly in the 650-750 range, with multiple readings over 800 km/s. Solar wind speeds slowly decreased on 28-29 Jun and ended the period near 470 km/s. The geomagnetic field responded with quiet to unsettled levels on 23-24 Jun, quiet to active levels on 25 Jun, unsettled to G1 (Minor) storming on 26-27 Jun, and back to quiet to unsettled levels on 28-29 Jun.

Space Weather Outlook
30 June - 26 July 2025

Solar activity is expected to be at low levels on 30 Jun - 04 Jul. Moderate (R1-R2, Minor-Moderate) levels are likely on 05 Jul - 26 Jul with the return of old Regions 4114 (N21, L=035) and 4117 on 05 Jul and 12 Jul, respectively.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 30 Jun -01 Jul, 03 -08 Jul, and again on 20-26 Jul due to recurrent CH HSS influence.

Geomagnetic field activity is expected to reach unsettled to active levels with G1 (Minor) geomagnetic storming likely on 02-03 Jul with the arrival of the 28 Jun CME. Unsettled to active

levels are expected on 04-09, 11-19, 22-25 Jul with G1 (Minor) storming likely on 23-24 Jul due to recurrent CH HSS activity.

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
23 June	122	105	470	B6.7	7	0	0	2	0	0	0	0
24 June	120	87	305	B6.0	7	0	0	2	0	0	0	0
25 June	117	90	320	B4.8	4	0	0	7	0	0	0	0
26 June	117	91	340	B4.9	3	0	0	6	0	0	0	0
27 June	118	111	340	B5.1	3	0	0	3	0	0	0	0
28 June	122	103	380	B5.1	2	0	0	0	1	0	0	0
29 June	128	151	380	B6.3	2	0	0	0	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
23 June	1.1e+05	1.5e+04	4.9e+07
24 June	5.5e+05	1.5e+04	4.1e+07
25 June	5.3e+05	1.5e+04	2.9e+07
26 June	2.7e+05	1.5e+04	1.2e+07
27 June	4.8e+06	1.6e+04	7.5e+07
28 June	2.3e+06	1.7e+04	1.5e+08
29 June	5.4e+05	1.9e+04	2.1e+08

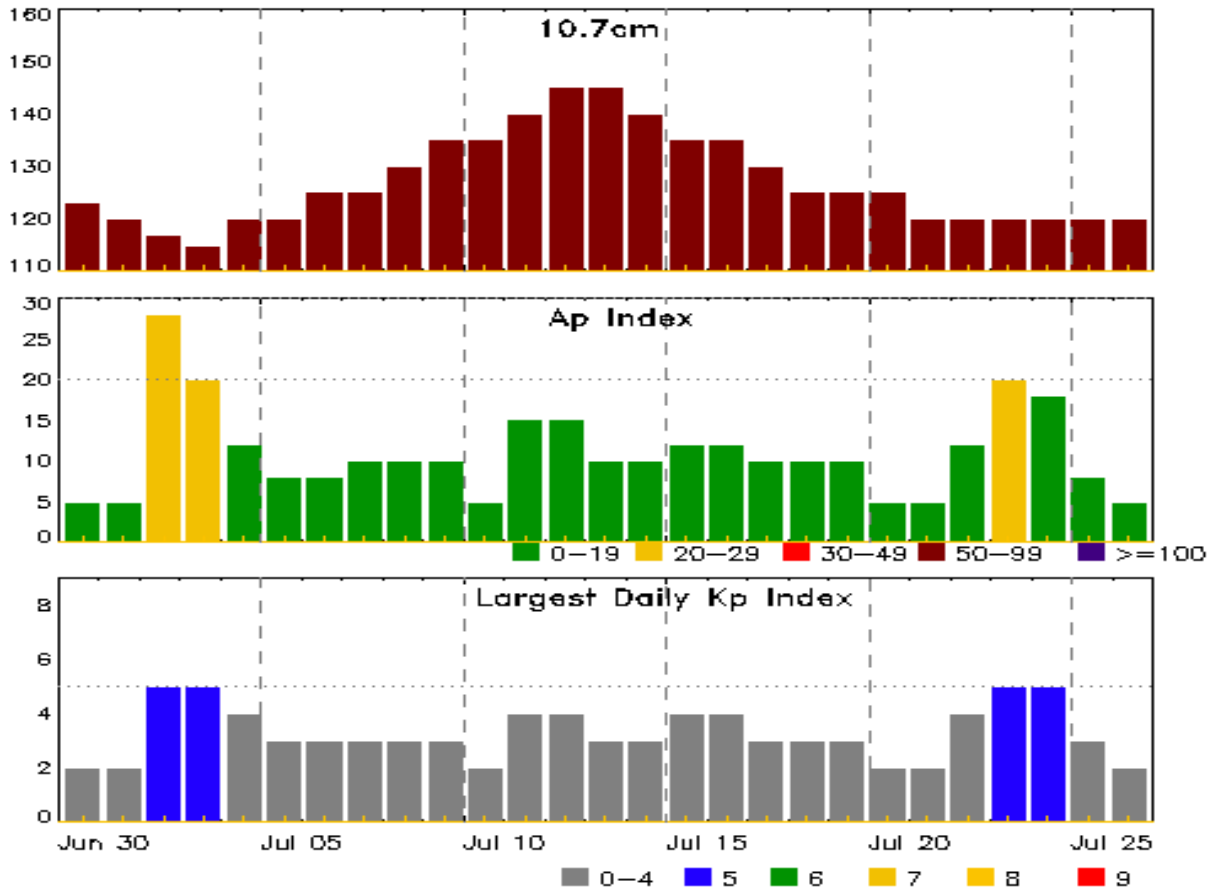
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
23 June	9	3-1-1-3-3-2-2-2	10	3-2-2-4-2-2-1-1	8	3-2-1-3-2-2-1-1
24 June	9	1-2-3-3-2-2-2-2	7	1-2-2-3-2-2-1-1	7	1-2-2-2-2-3-2-2
25 June	16	2-1-2-2-3-3-4-5	19	2-2-3-4-5-3-3-3	15	2-1-2-2-3-3-4-4
26 June	24	4-3-3-3-3-4-4-5	41	4-4-3-5-6-6-4-4	26	4-3-4-3-4-4-4-5
27 June	16	4-4-4-2-3-2-2-2	37	5-5-5-6-5-3-1-1	21	5-4-4-3-3-2-2-3
28 June	8	1-2-3-2-2-2-2-2	20	2-2-5-5-4-2-2-2	9	2-2-3-3-2-2-2-2
29 June	9	2-2-2-3-3-1-2-2	13	2-2-4-2-4-3-2-2	7	2-2-2-2-2-2-2-3

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
23 Jun 1440	ALERT: Electron 2MeV Integral Flux >= 1000pfu	23/1425
23 Jun 1700	WATCH: Geomagnetic Storm Category G2 predicted	
24 Jun 1447	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	23/1425
25 Jun 1324	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	23/1425
25 Jun 1722	WARNING: Geomagnetic K = 4	25/1722 - 26/1200
25 Jun 1831	WATCH: Geomagnetic Storm Category G1 predicted	
25 Jun 2005	ALERT: Geomagnetic K = 4	
25 Jun 2027	WARNING: Geomagnetic K = 5	25/2026 - 26/0900
26 Jun 1125	EXTENDED WARNING: Geomagnetic K = 4	25/1722 - 26/2359
26 Jun 1754	EXTENDED WARNING: Geomagnetic K = 4	25/1722 - 27/0600
26 Jun 2222	WARNING: Geomagnetic K = 5	26/2222 - 27/0600
26 Jun 2231	ALERT: Geomagnetic K = 5	
26 Jun 2235	WARNING: Geomagnetic K = 6	26/2235 - 27/0600
27 Jun 0139	ALERT: Geomagnetic K = 5	
27 Jun 0546	EXTENDED WARNING: Geomagnetic K = 4	25/1722 - 27/2100
27 Jun 1327	ALERT: Electron 2MeV Integral Flux >= 1000pfu	27/1310
27 Jun 1726	EXTENDED WARNING: Geomagnetic K = 4	25/1722 - 28/0600
28 Jun 0510	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	27/1310
29 Jun 0511	CONTINUED ALERT: Electron 2MeV Integral Flux >= 1000pfu	27/1310

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
30 Jun	123	5	2	14 Jul	140	10	3
01 Jul	120	5	2	15	135	12	4
02	117	28	5	16	135	12	4
03	115	20	5	17	130	10	3
04	120	12	4	18	125	10	3
05	120	8	3	19	125	10	3
06	125	8	3	20	125	5	2
07	125	10	3	21	120	5	2
08	130	10	3	22	120	12	4
09	135	10	3	23	120	20	5
10	135	5	2	24	120	18	5
11	140	15	4	25	120	8	3
12	145	15	4	26	120	5	2
13	145	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

No Events Observed

Flare List

	Time				Optical		
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
23 Jun	0040	0048	0055	B9.6			4118
23 Jun	0055	0059	0104	C1.0			4114
23 Jun	0209	0217	0225	C1.3			
23 Jun	0327	0333	0353	C1.4			4118
23 Jun	0456	0506	0516	C2.0	SF	S11E22	4118
23 Jun	0538	0547	0552	C3.4	SF	N17W84	4114
23 Jun	0702	0706	0710	C1.0			4118
23 Jun	0754	0801	0807	B8.8			
23 Jun	0807	0813	0816	B8.8			4114
23 Jun	1209	1223	1236	C5.0			4115
23 Jun	2108	2115	2123	B8.5			4115
24 Jun	0019	0028	0043	C1.1			4117
24 Jun	0128	0136	0151	B8.7			4115
24 Jun	0339	0343	0357	C1.0			4115
24 Jun	0440	0457	0531	C1.3	SF	S13W01	4117
24 Jun	1221	1227	1229	C1.1			
24 Jun	1439	1447	1456	C1.3			4118
24 Jun	1524	1545	1615	C3.1	SF	S13W07	4117
24 Jun	2037	2052	2102	C1.1			4118
25 Jun	0312	0318	0324	B7.1			4122
25 Jun	0428	0435	0438		SF	N15E71	
25 Jun	0511	0517	0519	B9.1	SF	N14E69	4122
25 Jun	0617	0623	0629	B7.7			4117
25 Jun	0649	0655	0700	B7.3			4122
25 Jun	0723	0727	0730	B9.5	SF	N13E67	4122
25 Jun	1552	1558	1608	B8.9	SF	N05W16	4120
25 Jun	1639	1642	1645		SF	N07W17	4120
25 Jun	1655	1655	1703		SF	S11W25	4117
25 Jun	1824	1832	1837	C1.1			4120
25 Jun	2102	2109	2119	C1.3	SF	N08W20	4120
25 Jun	2118	2123	2125	C1.2			

Flare List

Date	Time			X-ray	Optical		
	Begin	Max	End	Class	Imp/ Brtns	Location Lat CMD	Rgn #
25 Jun	2316	2324	2332	C1.2			4122
26 Jun	0033	0040	0049	C1.0			4120
26 Jun	0303	0309	0313		SF	N13E58	4122
26 Jun	0322	0323	0328		SF	N12E54	4122
26 Jun	0509	0514	0517	B7.2	SF	S13W35	4117
26 Jun	0635	0647	0656		SF	N15E54	4122
26 Jun	0832	0855	0950	C1.3	SF	S16W29	4117
26 Jun	1216	1222	1228	B7.7			
26 Jun	1812	1823	1831	B9.2	SF	N13E48	4122
26 Jun	2009	2017	2027	B7.5			4122
26 Jun	2031	2041	2048	C1.3			4122
27 Jun	0249	0305	0317	C1.9			4122
27 Jun	0403	0412	0419	B8.6			
27 Jun	0648	0650	0726		SF	N14E41	4122
27 Jun	0728	0730	0733	B8.7	SF	N14E40	4122
27 Jun	1027	1035	1044	C1.1	SF	N14E38	4122
27 Jun	1321	1333	1345	C1.2			4120
28 Jun	0358	0410	0421	C1.1			4126
28 Jun	1940	1954	2001	C4.0	1F	N07W22	4126
29 Jun	0815	0837	0845	C1.2			
29 Jun	1238	1245	1252	C1.0			

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 4114												
11 Jun	N17E63	36	30	4	Cro	6	B								
12 Jun	N18E57	33	70	5	Cai	5	B								
13 Jun	N18E39	34	80	7	Dai	14	B	2			4				
14 Jun	N17E26	34	270	10	Dki	19	BG	6			4				
15 Jun	N17E12	34	380	11	Ekc	27	BGD	9	2		14	1			
16 Jun	N18W01	34	330	11	Ekc	30	BGD	1	2		3	2			
17 Jun	N18W12	32	330	13	Ekc	32	BGD	2		1	7		1		
18 Jun	N18W26	33	360	13	Ekc	32	BG	6			10				
19 Jun	N21W41	35	400	13	Ekc	32	BG	3		1	4	1			
20 Jun	N18W54	34	270	14	Ekc	20	BG	1	1		1	1			
21 Jun	N19W67	34	320	12	Ehi	8	BG	1							
22 Jun	N20W78	32	220	12	Eso	3	B	1							
23 Jun	N20W91	32	90	2	Hsx	1	A	2			1				
								34	5	2	48	5	1	0	0

Crossed West Limb.
Absolute heliographic longitude: 34

			Region 4115												
11 Jun	N21E81	19	plage					1							
12 Jun	N21E67	19	180	10	Dso	4	B	3				1			
13 Jun	N21E53	20	150	10	Dso	3	B								
14 Jun	N21E40	20	160	12	Eso	3	B	1			1				
15 Jun	N21E26	20	150	12	Eso	4	B								
16 Jun	N21E12	21	100	13	Cso	3	B				1				
17 Jun	N20W01	21	120	11	Eso	5	B				3				
18 Jun	N20W15	22	110	12	Eso	8	BG	1			3				
19 Jun	N22W28	22	120	12	Eso	5	BG				1				
20 Jun	N22W41	21	70	12	Eso	5	B								
21 Jun	N22W54	21	80	14	Eso	7	B								
22 Jun	N22W66	20	80	11	Eso	3	B				1				
23 Jun	N21W80	21	30	1	Hsx	1	A	1							
24 Jun	N21W95	22	30	1	Hsx	1	A	1							
								8	0	0	10	1	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 21

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 4116												
14 Jun	S12E26	34	80	7	Dao	8	B	1			2				
15 Jun	S12E12	34	140	7	Dao	6	B								
16 Jun	S11W03	36	80	7	Dso	4	B								
17 Jun	S12W16	36	70	8	Dso	4	B								
18 Jun	S12W29	36	40	7	Cso	3	B								
19 Jun	S10W44	38	40	2	Hsx	2	A	1							
20 Jun	S12W57	37	10	1	Hsx	1	A								
21 Jun	S10W71	38	20	1	Hsx	1	A								
22 Jun	S10W82	36	20	1	Hsx	1	A								
								2	0	0	2	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 36

			Region 4117												
17 Jun	S16E77	303	plage						1						
18 Jun	S16E63	303	70	10	Dai	9	B	7			5				
19 Jun	S14E50	303	210	8	Dai	9	BG	4			6				
20 Jun	S14E38	302	80	8	Dai	6	B		1			1			
21 Jun	S15E23	304	200	8	Dai	7	B								
22 Jun	S15E11	303	190	8	Dsi	11	B	1			1				
23 Jun	S13W03	304	200	8	Dsi	13	B								
24 Jun	S14W17	304	150	8	Dso	6	B	3			2				
25 Jun	S14W31	304	160	9	Dso	5	B				1				
26 Jun	S14W45	306	130	6	Cso	6	B	1			2				
27 Jun	S14W60	308	100	7	Dso	4	B								
28 Jun	S14W72	306	90	8	Cso	2	B								
29 Jun	S14W86	307	60	2	Hsx	1	A								
								16	2	0	17	1	0	0	0

Still on Disk.
Absolute heliographic longitude: 304

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 4118												
19 Jun	S14E62	292	50	1	Dao	3	B								
20 Jun	S13E50	290	20	2	Hsx	2	A								
21 Jun	S14E36	291	60	2	Cao	3	B								
22 Jun	S13E22	292	120	5	Dai	12	B	2							
23 Jun	S12E08	293	120	7	Dai	11	BG	3			1				
24 Jun	S12W07	294	80	7	Cai	10	B	2							
25 Jun	S12W20	294	70	7	Cai	9	B								
26 Jun	S13W33	294	40	5	Cai	7	B								
27 Jun	S13W45	293	10	3	Bxo	4	B								
28 Jun	S13W60	294	plage												
29 Jun	S13W74	295	10	5	Bxo	5	B								
								7	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 294

			Region 4119												
23 Jun	S26W03	304	10	4	Bxo	3	B								
24 Jun	S25W16	303	5	1	Axx	2	A								
25 Jun	S25W30	304	plage												
26 Jun	S25W44	305	plage												
27 Jun	S25W58	306	plage												
28 Jun	S25W72	307	plage												
29 Jun	S25W86	307	plage												
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 304

			Region 4120												
23 Jun	N06E04	297	10	3	Bxo	3	B								
24 Jun	N06W10	297	10	4	Bxo	5	B								
25 Jun	N06W24	297	60	6	Dai	12	BG	2			3				
26 Jun	N07W37	298	90	7	Dai	14	BG	1							
27 Jun	N07W50	298	50	6	Dao	4	B	1							
28 Jun	N06W64	298	50	3	Dso	3	B								
29 Jun	N05W79	300	50	5	Cso	2	B								
								4	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 297

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 4121												
23 Jun	S12E25	276	10	3	Bxo	3	B								
24 Jun	S12E11	276	30	4	Dro	3	B								
25 Jun	S12W03	277	20	5	Dro	3	B								
26 Jun	S12W17	278	30	6	Dro	3	B								
27 Jun	S12W30	278	10	5	Cro	2	B								
28 Jun	S12W46	280	10	1	Axx	1	A								
29 Jun	S11W59	280	10	1	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 277

			Region 4122												
25 Jun	N13E55	219	10	5	Bxi	11	B	1							
26 Jun	N13E41	220	50	6	Dai	11	B	1			4				
27 Jun	N13E28	220	100	6	Dai	11	B	2			3				
28 Jun	N13E15	219	140	8	Dai	10	B								
29 Jun	N13E03	218	100	8	Dso	10	B								
								4	0	0	7	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 218

			Region 4123												
27 Jun	S25E21	227	10	2	Axx	2	A								
28 Jun	S25E07	227	10	1	Axx	1	A								
29 Jun	S28W09	230	20	4	Cro	5	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 227

			Region 4124												
27 Jun	S14E51	197	10	4	Bxo	3	B								
28 Jun	S15E37	197	10	4	Bxo	2	B								
29 Jun	S16E23	198	20	1	Hsx	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 198

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 4125												
27 Jun	N21E76	172	50	2	Hsx	1	A								
28 Jun	N21E61	173	50	4	Hsx	1	A								
29 Jun	N21E46	175	40	2	Hsx	1	A								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 175															
			Region 4126												
28 Jun	N07W27	261	20	3	Cro	3	B	2				1			
29 Jun	N07W42	263	10	3	Cso	3	B								
								2	0	0	0	1	0	0	0
Still on Disk.															
Absolute heliographic longitude: 261															
			Region 4127												
29 Jun	S18E34	187	30	4	Cro	7	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 187															
			Region 4128												
29 Jun	S05E40	181	30	5	Dao	5	B								
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 181															

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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