Space Weather Highlights
10 April - 16 April 2023

SWPC PRF 2485
17 April 2023

Solar activity ranged from low to moderate levels. Moderate levels were reached on 10, 11, and 14 Apr due to M-class flaring from Regions 3272 (S21, L=102, class/area Eai/280 on 09 Apr), 3276 (S20, L=050, class/area Dao/80 on 11 Apr), and 3282 (N11, L=024, class/area Eki/530 on 16 Apr). These included an M2 at 10/0520 UTC from Region 3276, an M1/1n at 11/1016 UTC from Region 3272, and a pair of M1 flares at 14/1618 UTC and 14/2327 UTC from Region 3282. The period began with initially two numbered spot groups, but grew to nine spotted regions by the end of the period.

Other activity included multiple filament eruption and CMEs. The majority of the CMEs were determined to not be Earth-directed. However, a slow moving partial halo CME was observed at 16/0125 UTC in SOHO/LASCO C2 imagery associated with a filament eruption near N20W40 at 15/2300 UTC in SUVI 304 imagery. Modelling and analysis of this event indicated the potential for a weak glancing blow on 22 Apr.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit was at normal to moderate levels throughout the period.

Geomagnetic field activity ranged from quiet to active levels. Solar wind parameters began with a solar sector boundary crossing around 10/0620 UTC followed by the onset of a positive polarity coronal hole high speed stream (CH HSS). Solar wind speeds increased to around 530 km/s by midday on 10 Apr before decreasing to near nominal levels by late on 11 Apr. Weaker positive polarity CH HSS conditions occurred on 14-15 Apr. The geomagnetic field responded with quiet to active levels on 10 Apr, quiet to unsettled levels on 11, 13-15 Apr, and quiet conditions on 12 and 16 Apr.

Space Weather Outlook
17 April - 13 May 2023

Solar activity is expected to remain at low levels with a chance for M-class (R1-R2, Minor-Moderate) flares and a slight chance for X-class (R3-Strong) flares on 17-25 Apr and again on 08-13 May due to the flare potential of Region 3282.

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 23 Apr-06 May due CH HSS influence.

Geomagnetic field activity is expected to reach unsettled to active levels on 21-22 Apr due to a combination of a glancing blow from the 16 Apr CME and the onset of a negative polarity CH HSS. Unsettled to active levels are again expected on 26 Apr-04 May, 07 May, and 11-12 May

with G1 (Minor) storm levels likely on 26-28 Apr and 30 Apr 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
10 April	140	92	455	B7.7	21	1	0	6	0	0	0	0
11 April	143	103	490	B7.0	9	1	0	7	2	0	0	0
12 April	154	127	580	C1.0	7	0	0	16	0	0	0	0
13 April	160	154	890	C1.3	12	0	0	15	0	0	0	0
14 April	171	153	1120	C1.5	12	2	0	13	2	0	0	0
15 April	176	151	1170	C1.4	16	0	0	23	2	0	0	0
16 April	178	155	1340	C1.2	4	0	0	9	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
10 April	4.3e+05	2.2e+04	1.8e+06
11 April	6.0e+04	2.2e+04	1.6e+06
12 April	3.8e+04	2.3e+04	1.5e+06
13 April	4.0e+04	2.4e+04	1.7e+06
14 April	3.5e+04	2.3e+04	1.6e+06
15 April	3.5e+04	2.3e+04	1.3e+06
16 April	3.3e+04	2.3e+04	1.3e+06

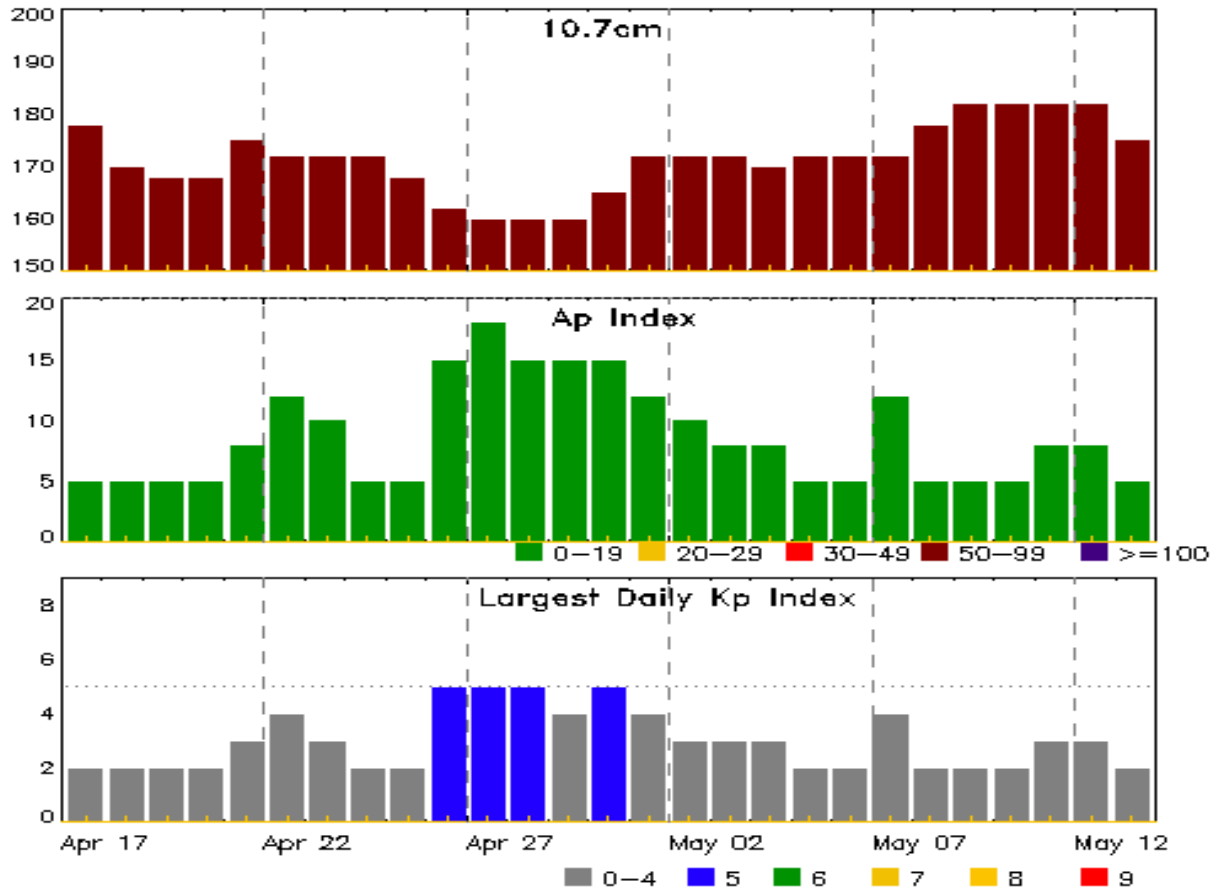
Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
10 April	11	2-3-3-2-4-2-1-2	21	2-5-5-3-4-3-1-1	14	3-3-4-3-3-3-1-2
11 April	6	1-1-3-1-2-2-1-1	7	0-2-4-2-1-1-2-0	6	1-1-3-1-1-1-1-1
12 April	4	0-1-2-1-2-1-1-1	1	0-0-1-0-1-1-0-0	4	1-1-2-1-2-1-1-1
13 April	5	2-2-1-1-2-2-1-1	3	2-1-0-0-0-2-1-1	6	3-2-1-0-1-2-2-2
14 April	10	2-1-2-3-3-2-3-2	11	1-0-2-3-5-2-1-1	7	2-1-2-2-3-2-1-2
15 April	8	2-1-3-2-3-1-1-2	14	1-2-3-4-5-2-1-1	9	3-2-3-2-3-2-1-2
16 April	4	1-1-2-2-1-1-1-1	7	1-1-4-3-1-0-0-1	5	1-1-2-1-1-0-0-1

Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
10 Apr 0630	WARNING: Geomagnetic K = 4	10/0630 - 1500
10 Apr 0900	ALERT: Geomagnetic K = 4	10/0859
11 Apr 0757	WARNING: Geomagnetic K = 4	11/0757 - 1200

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
17 Apr	178	5	2	01 May	172	12	4
18	170	5	2	02	172	10	3
19	168	5	2	03	172	8	3
20	168	5	2	04	170	8	3
21	175	8	3	05	172	5	2
22	172	12	4	06	172	5	2
23	172	10	3	07	172	12	4
24	172	5	2	08	178	5	2
25	168	5	2	09	182	5	2
26	162	15	5	10	182	5	2
27	160	18	5	11	182	8	3
28	160	15	5	12	182	8	3
29	160	15	4	13	175	5	2
30	165	15	5				

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
10 Apr	0510	0520	0528	M2.8	0.018				3276			
11 Apr	0951	1016	1023	M1.3	0.010	1N		S20E17	3272			
14 Apr	1610	1618	1625	M1.1	0.006				3282			
14 Apr	2318	2327	2331	M1.5	0.005	1N		N11E54	3282			

Flare List

	Time			Optical			
Date	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
10 Apr	0123	0136	0142	C2.8	SF	S23E40	3272
10 Apr	0206	0211	0217	C1.0			3272
10 Apr	0217	0227	0247	C1.4			3276
10 Apr	0401	0405	0411	C1.2			3272
10 Apr	0414	0429	0937	C3.5			3276
10 Apr	0432	0439	0445	C6.0			3276
10 Apr	0510	0520	0528	M2.8			3276
10 Apr	0937	0945	0951	C2.9			3276
10 Apr	1122	1130	1138	C1.3			3272
10 Apr	1308	1318	1323	C1.3			3276
10 Apr	1323	1337	1346	C1.6			3276
10 Apr	1346	1351	1356	C6.0	SN	S22E31	3272
10 Apr	1428	1436	1441	C1.3			3272
10 Apr	1442	1448	1454	C2.1			3276
10 Apr	1535	1547	1554	C3.3	SF	S23E33	3272
10 Apr	1647	1654	1659	C1.8			3272
10 Apr	1720	1739	1747	C3.3			3276
10 Apr	1849	1856	1901	C1.9			3276
10 Apr	1932	1940	1946	C1.4	SF	S18E26	3272
10 Apr	2018	2018	2024		SF	N10E16	3273
10 Apr	2230	2234	2240	C1.8			3272
10 Apr	2243	2248	2254		SF	S18E24	3272
10 Apr	2315	2319	2324	C2.3			3276
10 Apr	2358	0005	0010	C2.6			3276
11 Apr	0124	0133	0138	C1.2			3276
11 Apr	0141	0145	0150	C1.5			3276
11 Apr	0259	0307	0313	C6.3	SF	S19E20	3272

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
11 Apr	0517	0525	0531	C1.4			
11 Apr	0625	0626	0628		SF	S23E24	3272
11 Apr	0705	0712	0719	C1.1	SF	S20E18	3272
11 Apr	0805	0815	0825	C1.6			3276
11 Apr	0942	0947	0951	C1.1	SF	S23E23	3272
11 Apr	0951	1016	1023	M1.3	1N	S20E17	3272
11 Apr	1152	1153	1201		SF	S19E69	3276
11 Apr	1432	1441	1449	C2.1	SF	N10E05	3273
11 Apr	1953	1956	2011		SF	S08W11	3274
11 Apr	2230	2242	2256	C5.9	1B	S20E09	3272
12 Apr	0450	0502	0510	C2.8			3276
12 Apr	0836	0842	0848	C3.4	SF	S19E69	3276
12 Apr	1133	1153	1204	C6.1	SF	S20E70	3276
12 Apr	1334	1336	1343		SF	N00E00	
12 Apr	1358	1408	1438		SF	S22E78	
12 Apr	1450	1509	1545		SF	S22E79	3272
12 Apr	1459	1502	1508		SF	S18E01	3272
12 Apr	1538	1544	1548	C5.2			3272
12 Apr	1553	1602	1630		SF	N00E00	3279
12 Apr	1713	1726	1734		SF	N00E00	
12 Apr	1746	1801	1817		SF	N00E00	
12 Apr	1925	1928	1931		SF	S22E03	3272
12 Apr	2103	2119	2116		SF	S24E87	
12 Apr	2222	2229	2233	C1.9	SF	S20E62	3279
12 Apr	2254	2303	2306	C1.8	SF	S21E64	3279
12 Apr	2317	2318	2319		SF	S19E62	3279
12 Apr	2326	2335	2349	C4.8	SF	S21E64	3279
12 Apr	2332	2337	2348		SF	S19E62	3279
13 Apr	0027	0038	0055		SF	S22W00	3272
13 Apr	0037	0041	0054		SF	S21E62	3279
13 Apr	0046	0049	0050	C3.3	SF	S19E62	3279
13 Apr	0115	0123	0131	C3.7	SF	S19E62	3279
13 Apr	0217	0224	0231	C2.5	SF	S19E62	3279
13 Apr	0354	0407	0411	C2.2			3280
13 Apr	0424	0434	0441	C2.0			3272
13 Apr	0540	0541	0544		SF	S10W16	
13 Apr	0602	0605	0628		SF	S20E59	3279
13 Apr	0753	0759	0803	C3.9	SF	S20E56	3279

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
13 Apr	0811	0818	0829	C3.8	SF	S23E75	3281
13 Apr	0913	0915	0920		SF	S21E57	3279
13 Apr	0957	1003	1007		SF	S21E57	3279
13 Apr	1032	1043	1053	C8.4	SN	S19W08	3272
13 Apr	1053	1056	1100	C6.7	SF	S20E54	3279
13 Apr	1153	1156	1202	C4.3	SF	S20E53	3279
13 Apr	1850	1857	1903	C2.2			3281
13 Apr	2029	2036	2042	C2.1	SF	N10E68	3282
14 Apr	0307	0315	0324		SF	N12E63	3282
14 Apr	0400	0408	0409		SF	N12E61	3282
14 Apr	0508	0516	0528	C2.2	SF	S22E66	3281
14 Apr	0620	0625	0628		SF	S08W33	3280
14 Apr	0647	0649	0703		SF	S08W33	3280
14 Apr	0912	0914	0919		SF	N13E62	3282
14 Apr	1046	1052	1057	C3.3			3282
14 Apr	1244	1255	1305	C6.9	1F	N12E57	3282
14 Apr	1317	1320	2114	C3.7	1F	N11E53	3282
14 Apr	1337	1345	1351	C3.2	SF	S08W33	3280
14 Apr	1446	1447	1451		SF	S21E42	3279
14 Apr	1543	1549	1553	C2.3			3281
14 Apr	1602	1606	1608		SF	S11W35	3280
14 Apr	1610	1618	1625	M1.1			3282
14 Apr	1644	1659	1708	C5.3			3282
14 Apr	1850	1907	1920	C2.9	SF	S10W41	3280
14 Apr	1920	1926	1936	C3.1			3282
14 Apr	1951	1956	2000	C4.5			3282
14 Apr	2039	2045	2051	C6.2			3282
14 Apr	2057	2101	2105	C5.1			3282
14 Apr	2143	2143	2151		SF	N11E55	3282
14 Apr	2203	2222	2227		SF	N11E55	3282
14 Apr	2229	2252	2255		SF	N11E54	3282
14 Apr	2318	2327	2331	M1.5	1N	N11E54	3282
15 Apr	0132	0137	0141	C2.8			3280
15 Apr	0149	0156	0201	C2.4			3272
15 Apr	0300	0306	0310	C3.3	SF	S11W33	3280
15 Apr	0518	0523	0531	C3.9			3282
15 Apr	0538	0546	0550	C2.9	SF	S19E20	3282
15 Apr	0550	0601	0607	C3.2			3272

Flare List

Date	Time			Optical			
	Begin	Max	End	X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
15 Apr	0627	0647	0659	C5.0			3280
15 Apr	0659	0703	0707	C4.4			3280
15 Apr	0844	0852	0858	C5.3	SF	N14E39	3282
15 Apr	0851	0851	0853		SF	S21E50	3281
15 Apr	0905	0914	0918	C7.1	SF	N13E44	3282
15 Apr	0937	0938	0944		SF	N13E44	3282
15 Apr	0945	0954	0958	C3.5	SF	S06W46	3280
15 Apr	0955	0957	1000		SF	N13E44	3282
15 Apr	1101	1107	1109		SF	N13E42	3282
15 Apr	1153	1157	1201		SF	N13E42	3282
15 Apr	1249	1256	1302	C2.4	SF	S21E49	3281
15 Apr	1316	1323	1330	C2.6			3279
15 Apr	1346	1346	1348		SF	N13E45	3282
15 Apr	1356	1426	A1501		SF	N13E46	3282
15 Apr	1438	1438	1441		SF	N11E43	3282
15 Apr	1505	1509	1519		SF	S08W48	3280
15 Apr	1611	1618	1625	C3.3	SF	S22E50	3281
15 Apr	1712	1723	1733	C5.4	1F	S08W50	3280
15 Apr	1903	1905	1908		SF	S24E47	3281
15 Apr	1913	1914	1915		SF	N11E41	3282
15 Apr	1945	1948	1951		SF	S23E49	3281
15 Apr	2030	2031	2033		SF	N11E38	3282
15 Apr	2038	2038	2044		SF	S24E45	3281
15 Apr	2042	2053	2150		SF	N12E40	3282
15 Apr	2110	2122	2137	C3.3			3282
15 Apr	2133	2133	2136		SF	S20E10	3276
16 Apr	0029	0034	0051		SF	S07W56	3280
16 Apr	0039	0041	0043		SF	S24E41	3281
16 Apr	0049	0050	0055		SF	N11E37	3282
16 Apr	0328	0339	0348	C3.3			3281
16 Apr	0933	0937	0946	C2.0	SF	S11W33	3280
16 Apr	1731	1744	1800	C9.0			
16 Apr	1936	1956	2109	C3.7	SF	S06W69	3280
16 Apr	2231	2233	2237		SF	S06W69	3280
16 Apr	2306	2344	A2359		SF	S11W33	3280
16 Apr	2309	2317	2318		SF	S06W69	3280
16 Apr	2325	2344	A2359		SF	S06W69	3280

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 3269													
02 Apr	S25E42	191	10	1	Axx	2	A								
03 Apr	S25E28	192	plage												
04 Apr	S25E14	193	plage												
05 Apr	S25W00	194	plage												
06 Apr	S25W14	194	plage												
07 Apr	S25W28	195	plage												
08 Apr	S25W41	195	plage								1				
09 Apr	S25W54	195	plage												
10 Apr	S25W68	195	plage												
11 Apr	S25W82	196	plage												
								0	0	0	1	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 194

		Region 3271													
04 Apr	S17W18	224	0	2	Axx	2	A								
05 Apr	S16W33	226	plage												
06 Apr	S16W47	227	plage												
07 Apr	S16W61	228	plage												
08 Apr	S16W74	228	plage												
09 Apr	S16W87	228	plage												
								0	0	0	0	0	0	0	0

Crossed West Limb.
Absolute heliographic longitude: 224

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 3272													
05 Apr	S20E86	107	plage					6							
06 Apr	S21E72	107	40	5	Cso	1	B	4	1						
07 Apr	S22E63	104	180	11	Eai	12	BG	5			3				
08 Apr	S21E50	104	230	14	Eai	26	BG	10	1		8	1			
09 Apr	S21E38	102	280	14	Eai	24	BG	8			6				
10 Apr	S22E24	102	265	13	Ekc	31	BG	10			5				
11 Apr	S21E10	102	250	16	Fkc	36	BG	4	1		4	2			
12 Apr	S22W02	103	250	16	Fkc	32	BG	1			3				
13 Apr	S22W14	102	150	15	Eai	22	B	2			2				
14 Apr	S23W29	103	60	12	Cao	12	B								
15 Apr	S23W41	102	30	11	Cro	6	B	2							
16 Apr	S22W55	103	30	10	Cro	6	B								
								52	3	0	31	3	0	0	0

Still on Disk.
Absolute heliographic longitude: 103

		Region 3273													
09 Apr	N10E27	113	50	4	Cao	8	B	2			1				
10 Apr	N10E13	114	120	6	Dso	6	B				1				
11 Apr	N09W01	114	100	7	Dsi	12	B	1			1				
12 Apr	N10W14	114	90	7	Cso	11	B								
13 Apr	N09W29	117	70	2	Cso	3	B								
14 Apr	N09W43	117	30	1	Hsx	1	A								
15 Apr	N09W56	117	20	1	Hrx	1	A								
16 Apr	N08W69	117	10	1	Axx	1	A								
								3	0	0	3	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 114

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 3274												
10 Apr	S07W02	128	10	5	Axx	1	A								
11 Apr	S07W17	131	plage								1				
12 Apr	S07W32	133	plage												
13 Apr	S07W47	135	plage												
14 Apr	S07W60	135	plage												
15 Apr	S07W73	135	plage												
16 Apr	S07W86	135	plage												
								0	0	0	1	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 128

			Region 3275												
10 Apr	N21E61	65	40	4	Hsx	1	A								
11 Apr	N20E48	65	50	1	Hsx	1	A								
12 Apr	N19E35	65	40	1	Hsx	1	A								
13 Apr	N19E22	66	50	1	Hsx	1	A								
14 Apr	N19E08	66	30	1	Hax	1	A								
15 Apr	N19W04	65	20	1	Hax	1	A								
16 Apr	N19W17	65	20	1	Hax	1	A								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 65

			Region 3276												
10 Apr	S22E75	52	20	5	Dao	3	B	11	1						
11 Apr	S20E63	50	80	7	Dao	3	B	3			1				
12 Apr	S21E52	54	20	1	Hsx	1	A	1			2				
13 Apr	S22E34	54	20	1	Hsx	1	A								
14 Apr	S22E21	53	10	1	Axx	1	A								
15 Apr	S22E08	53	10	1	Bxo	2	B				1				
16 Apr	S23W06	54	20	3	Bxi	5	B								
								15	1	0	4	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 54

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 3277												
11 Apr	N10E20	92	10	1	Cro	1	B								
12 Apr	N10E08	92	20	6	Bxo	3	B								
13 Apr	N10W06	94	plage												
14 Apr	N10W19	94	plage												
15 Apr	N10W32	94	plage												
16 Apr	N10W45	94	plage												
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 94															
			Region 3278												
12 Apr	N13W34	134	10	2	Bxo	2	B								
13 Apr	N12W46	134	10	1	Axx	1	A								
14 Apr	N12W59	134	plage												
15 Apr	N12W72	134	plage												
16 Apr	N12W85	134	plage												
								0	0	0	0	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 134															
			Region 3279												
12 Apr	S20E60	41	150	5	Dai	7	B	5			6				
13 Apr	S20E51	37	230	13	Eai	11	B	6			10				
14 Apr	S21E38	36	180	12	Eai	22	B				1				
15 Apr	S20E24	38	140	14	Cai	18	B	1							
16 Apr	S20E11	37	180	14	Dsi	10	B								
								12	0	0	17	0	0	0	0
Still on Disk.															
Absolute heliographic longitude: 37															
			Region 3280												
13 Apr	S09W27	115	80	8	Dai	17	B	1							
14 Apr	S09W41	115	180	8	Dai	20	BG	2			5				
15 Apr	S08W56	117	240	9	Dsi	14	BG	6			3	1			
16 Apr	S07W71	119	200	9	Csi	8	BG	2			7				
								11	0	0	15	1	0	0	0
Still on Disk.															
Absolute heliographic longitude: 115															

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 3281												
13 Apr	S23E71	17	220	9	Dao	5	B	2							
14 Apr	S24E55	19	350	10	Dko	8	B	2			1				
15 Apr	S24E44	17	310	12	Dko	12	BG	2			6				
16 Apr	S24E32	16	300	11	Eki	12	BG	1			1				
								7	0	0	8	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 16

			Region 3282												
13 Apr	N11E66	22	60	4	Cao	3	B	1			1				
14 Apr	N11E52	22	280	8	Dko	8	B	8	2		6	2			
15 Apr	N11E38	23	400	10	Dki	17	B	5			13	1			
16 Apr	N11E24	24	530	12	Eki	17	B				1				
								14	2	0	21	3	0	0	0

Still on Disk.
Absolute heliographic longitude: 24

			Region 3283												
16 Apr	S22E48	1	50	4	Cri	5	B								
								0	0	0	0	0	0	0	0

Still on Disk.
Absolute heliographic longitude: 1

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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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