

Solar activity was at low levels on 08-09 Jan, reached moderate levels on 10-12 Jan, and returned back to low levels on 13-14 Jan. Multiple M1 flares (R1/Minor) occurred on 10-12 Jan from Regions 3538 (N20, L=176, class/area Cai/080 on 09 Jan), 3539 (N10, L=139, class/area Dai/230 on 11 Jan), and 3547 (N19, L=064, class/area Cso/050 on 12 Jan). Two CMEs were modelled over the period from 09-10 Jan with potential for grazing blows. The first was an approximate 50 degree filament eruption centered near S42E43 that began after 09/1400 UTC. An associated CME was observed off the SE limb beginning at 09/1536 UTC. Modelling of the event showed a potential grazing late on 13 Jan. The second event was associated with a C6.5 flare at 10/1907 UTC from Region 3536 (N06, L=151, class/area Eko/250 on 03 Jan). A subsequent CME was observed off the W limb at 10/1924 UTC. Modelling indicated the potential for a grazing late on 14 Jan.

No proton events were observed at geosynchronous orbit.

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

Geomagnetic field activity was mostly quiet with an isolated unsettled period on 09 Jan. Solar wind parameters were near nominal levels throughout with slightly increased total field measurements between 08/1650-11/0100 UTC and between 14/0315-14/2100 UTC. Solar wind speed showed an increase from 300 km/s to near 470 km/s between 08/0000-11/2200 UTC. Afterward, speed, temperature, and density values appeared to be suspect due to low densities in the solar wind. A comparison with the University of Maryland SOHO/CELIAS/MTOF/PM appeared to show a drop in solar wind speed starting late on 11 Jan.

Space Weather Outlook **15 January - 10 February 2024**

Solar activity is expected to be primarily at low levels with a chance for M-class (R1-R2/Minor-Moderate) flares on 15 Jan-10 Feb.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at normal to moderate levels on 15 Jan-10 Feb.

Geomagnetic field activity is expected to reach unsettled levels with a chance for isolated active periods on 16-18 Jan and again on 28-30 Jan 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
08 January	176	152	700	C1.2	10	0	0	4	0	1	0	0
09 January	176	183	1060	C1.2	10	0	0	5	0	0	0	0
10 January	186	183	1200	C2.0	15	2	0	3	0	0	0	0
11 January	193	151	810	C2.0	15	3	0	11	0	0	0	0
12 January	186	188	800	C1.7	11	1	0	11	0	0	0	0
13 January	185	191	990	C1.4	2	0	0	5	0	0	0	0
14 January	188	183	940	C1.4	12	0	0	3	1	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	
	08 January	5.5e+06	5.9e+04	2.8e+06
09 January	2.4e+06	3.3e+04	1.7e+06	
10 January	9.9e+05	2.5e+04	1.3e+06	
11 January	3.6e+05	2.1e+04	1.7e+06	
12 January	1.8e+05	1.9e+04	2.3e+06	
13 January	2.0e+05	1.8e+04	3.0e+06	
14 January	3.6e+05	2.1e+04	2.0e+06	

Daily Geomagnetic Data

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	08 January	4	0-1-0-1-2-2-2-1	3	0-0-0-1-3-1-0-1	4
09 January	5	1-1-3-1-1-2-1-1	4	1-0-2-3-2-1-0-0	6	2-2-3-1-1-2-1-1
10 January	7	1-2-1-3-2-2-2-1	13	0-0-0-5-5-1-1-0	7	2-2-1-2-2-2-2-2
11 January	4	0-1-1-2-2-2-1-1	11	0-0-3-3-5-1-0-1	6	1-1-2-2-2-1-1-2
12 January	4	0-2-1-2-2-2-1-0	4	0-0-1-2-2-3-0-0	4	1-1-1-1-1-1-1-1
13 January	3	1-0-0-2-2-2-1-0	1	0-0-1-1-0-0-0-0	3	1-0-0-1-1-1-1-1
14 January	5	0-1-2-1-2-1-2-2	10	0-1-2-4-3-3-2-1	4	1-1-2-2-2-2-2-2

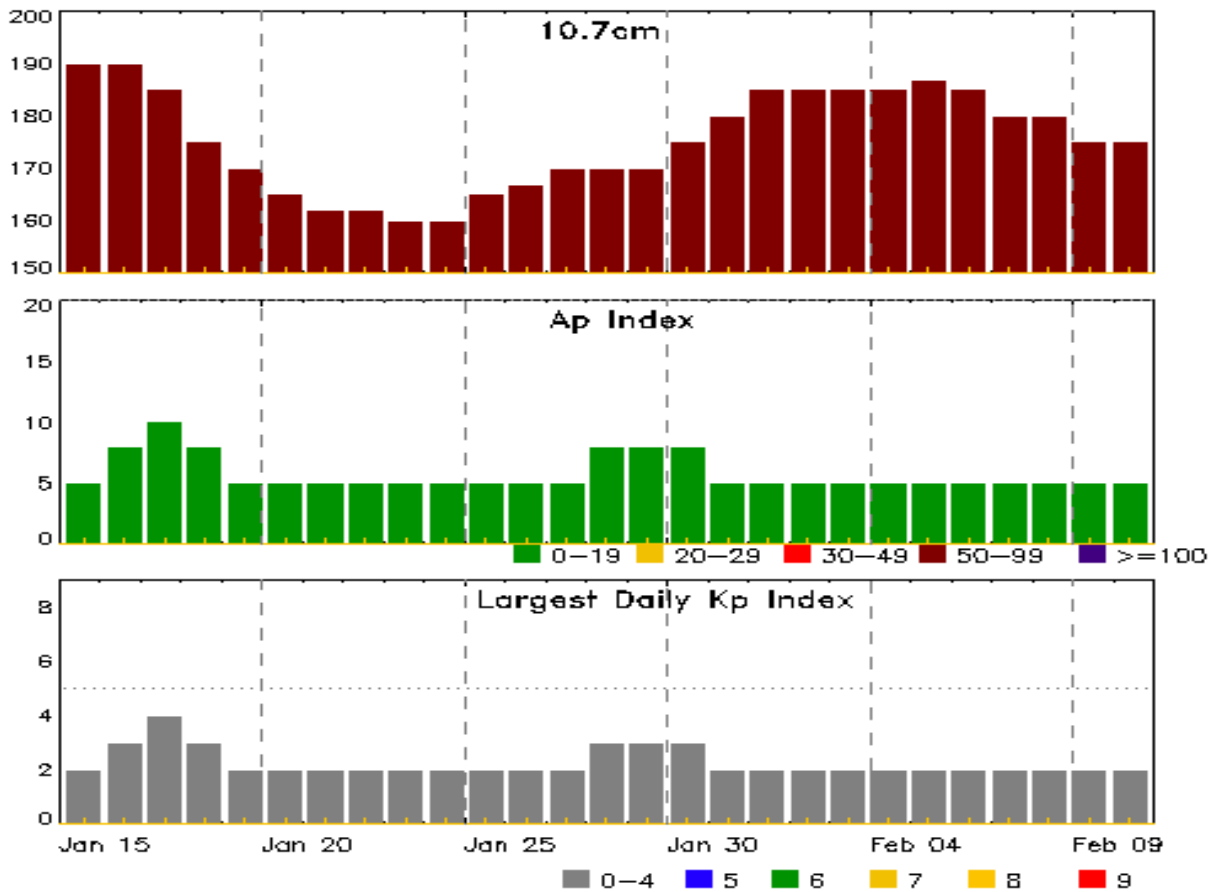


Alerts and Warnings Issued

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
10 Jan 1920	SUMMARY: 10cm Radio Burst	10/1901 - 1904
14 Jan 1204	ALERT: Type II Radio Emission	14/1146



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
15 Jan	190	5	2	29 Jan	170	8	3
16	190	8	3	30	175	8	3
17	185	10	4	31	180	5	2
18	175	8	3	01 Feb	185	5	2
19	170	5	2	02	185	5	2
20	165	5	2	03	185	5	2
21	162	5	2	04	185	5	2
22	162	5	2	05	187	5	2
23	160	5	2	06	185	5	2
24	160	5	2	07	180	5	2
25	165	5	2	08	180	5	2
26	167	5	2	09	175	5	2
27	170	5	2	10	175	5	2
28	170	8	3				



Energetic Events

Date	Time			X-ray	Optical Information				Peak		Sweep Freq		
	Begin	Max	Half	Class	Integ Flux	Imp/ Brtns	Location		Rgn #	Radio Flux		Intensity	
			Max				Lat	CMD		245	2695	II	IV
10 Jan	1239	1255	1305	M1.4	0.016								
10 Jan	2318	2328	2335	M1.9	0.010	SF	N22W77		3538				
11 Jan	1244	1251	1255	M1.3	0.006				3538	130			
11 Jan	1749	1752	1759	M1.5	0.007				3539				
11 Jan	1908	1923	1949	M1.2	0.022				3538	390			
12 Jan	0255	0258	0302	M1.0	0.003	SN	N18E20		3547				

Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
08 Jan	0248	0252	0259	C2.4	SF	S19E45		3540
08 Jan	0459	0500	0501		SF	S08W23		3543
08 Jan	0800	0807	0813	C1.7				3538
08 Jan	0805	0807	0810		SF	N18W46		3538
08 Jan	0813	0824	0838	C2.8	SF	N19W14		3542
08 Jan	0946	0959	1015	C7.3	2N	N10W10		3539
08 Jan	1511	1522	1533	C2.9				3542
08 Jan	1542	1550	1559	C5.7				3538
08 Jan	1915	1930	1941	C4.0				3538
08 Jan	2054	2107	2110	C2.0				3538
08 Jan	2110	2116	2120	C2.1				3538
08 Jan	2120	2124	2128	C2.1				3538
09 Jan	0243	0249	0255	C1.9				3541
09 Jan	0401	0411	0414	C3.1				3538
09 Jan	0836	0850	0859	C2.5				3538
09 Jan	1107	1123	1134	C3.8				3541
09 Jan	1446	1454	1457	C1.9				3538
09 Jan	1457	1503	1507	C1.9				3538
09 Jan	1531	1708	1713		SF	N20W66		3538
09 Jan	1639	1640	1642		SF	S25E25		3540
09 Jan	1702	1710	1719	C2.7				3538
09 Jan	1725	1726	1729		SF	N19W69		3538
09 Jan	1740	1744	1746		SF	N20W71		3538
09 Jan	1900	1905	1913	C1.8				3536
09 Jan	1932	1936	1943	C3.9	SF	N19W68		3538



Flare List

Date	Time			X-ray Class	Optical		
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	Rgn #
09 Jan	2351	2356	0000	C2.4			3536
10 Jan	0202	0212	0230	C3.3			3546
10 Jan	0240	0246	0250	C3.2			3538
10 Jan	0307	0316	0318	C5.4			
10 Jan	0318	0325	0329	C9.6			3538
10 Jan	0429	0433	0437	C7.0			3538
10 Jan	0533	0545	0602	C7.0			
10 Jan	0648	0656	0703	C6.6			
10 Jan	0856	0903	0923	C3.5			
10 Jan	0959	1006	1010	C5.2	SF	N21W72	3538
10 Jan	1239	1255	1305	M1.4			
10 Jan	1412	1427	1441	C4.5			
10 Jan	1510	1515	1520	C4.0			
10 Jan	1605	1606	1616		SF	S20E09	3540
10 Jan	1856	1907	1916	C6.5			3536
10 Jan	1953	2000	2005	C3.0			3538
10 Jan	2028	2041	2100	C5.6			
10 Jan	2153	2201	2205	C6.0			
10 Jan	2318	2328	2335	M1.9	SF	N22W77	3538
11 Jan	0108	0112	0118	C5.2	SF	N09W43	3539
11 Jan	0339	0343	0348	C4.6	SF	S25E35	3546
11 Jan	0406	0415	0422	C3.1	SF	N09W46	3539
11 Jan	0540	0542	0543		SF	S25E33	3546
11 Jan	0605	0605	0608		SF	S23E03	3540
11 Jan	0615	0619	0626	C7.8	SF	N13W47	3539
11 Jan	0638	0639	0642		SF	N22W84	3538
11 Jan	0801	0803	0808	C4.1	SF	S22E02	3540
11 Jan	0854	0901	0910	C6.4	SF	N09W52	3539
11 Jan	1002	1009	1014	C3.0			3539
11 Jan	1031	1042	1050	C3.9			3538
11 Jan	1124	1134	1139	C4.2			
11 Jan	1158	1209	1225	C9.4			3538
11 Jan	1244	1251	1255	M1.3			3538
11 Jan	1559	1611	1618	C3.6			3538
11 Jan	1618	1632	1643	C6.4			
11 Jan	1643	1646	1650	C8.3			
11 Jan	1749	1752	1759	M1.5			3539
11 Jan	1908	1923	1949	M1.2			3538



Flare List

Date	Time			X-ray Class	Imp/ Brtns	Optical		Rgn #
	Begin	Max	End			Location Lat CMD		
11 Jan	2245	2254	2300	C3.6	SF	N09W60		3539
11 Jan	2300	2311	2320	C4.6	SF	N10E54		3539
12 Jan	0255	0258	0302	M1.0	SN	N18E20		3547
12 Jan	0350	0359	0410	C5.7	SF	N10W57		3539
12 Jan	0410	0415	0419	C6.0	SF	N12E56		3548
12 Jan	0429	0429	0431		SF	N11E51		
12 Jan	0608	0615	0622	C3.8	SF	N11E51		3548
12 Jan	0623	0628	0633	C4.4				3539
12 Jan	0814	0820	0824	C3.7				3539
12 Jan	B0844	U0847	A0848		SF	N11E50		
12 Jan	B0850	U0855	A0901		SF	N11E50		
12 Jan	0959	1006	1011	C5.9	SF	S22W13		3541
12 Jan	1005	1006	1010		SF	S17W11		3540
12 Jan	1056	1057	1103		SF	S22W14		
12 Jan	1103	1115	1136	C3.9				3537
12 Jan	1136	1142	1151	C3.8				3536
12 Jan	1532	1538	1553	C3.2	SF	N10W69		3539
12 Jan	1701	1716	1736	C4.7				3538
12 Jan	2226	2240	2302	C3.8				3538
13 Jan	0414	0421	0425	C2.7				
13 Jan	1721	1721	1738		SF	S21W31		3541
13 Jan	1747	1751	1753		SF	S21W34		3541
13 Jan	1945	1948	1952		SF	S21W33		3541
13 Jan	2049	2050	2053		SF	S08E19		3545
13 Jan	2322	2326	2333	C2.3	SF	S21W35		3541
14 Jan	0012	0022	0029	C4.2				3539
14 Jan	0135	0138	0142	C2.0				3541
14 Jan	0249	0256	0308	C2.0				3545
14 Jan	0425	0434	0503	C1.9				3545
14 Jan	0658	0719	0727	C2.6				
14 Jan	0727	0730	0735	C2.8	SF	S19W42		3541
14 Jan	1109	1119	1130	C2.7				3541
14 Jan	1130	1206	1226	C9.6				
14 Jan	1300	1308	1316	C7.2				3549
14 Jan	1654	1701	1707	C5.8	1N	S22W43		3541
14 Jan	1840	1844	1850	C3.2				3549
14 Jan	1858	1902	1951		SF	S19E43		3549
14 Jan	1906	1907	1911		SF	S17W48		3541



Flare List

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
14 Jan	1949	1953	1958	C3.0			3541



Region Summary

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 3534																		
27 Dec	S12E60	218	20	3	Cro	4	B	2										
28 Dec	S12E47	220	20	8	Cro	5	B	1										
29 Dec	S13E30	223	90	9	Dao	9	B											
30 Dec	S13E15	226	150	9	Dao	12	B	1										
31 Dec	S13E03	224	120	8	Dao	10	B											
01 Jan	S14W11	225	10	7	Bxo	8	B											
02 Jan	S12W22	222	10	7	Bxo	4	B											
03 Jan	S14W37	225	10	1	Bxo	2	B					1						
04 Jan	S15W51	226	30	5	Dao	5	B											
05 Jan	S15W61	223	70	4	Dao	3	B	1				1						
06 Jan	S15W75	223	70	4	Hsx	3	A											
07 Jan	S12W86	220	80	3	Hsx	2	A	1										
								6	0	0	2	0	0	0	0	0		

Crossed West Limb.
 Absolute heliographic longitude: 224

Region 3536																		
30 Dec	N05E90	152	plage					1										
31 Dec	N05E75	152	80	3	Hax	2	A	7	1	1								1
01 Jan	N06E63	151	140	13	Eai	5	BD	6	2			4	1					
02 Jan	N05E49	151	240	13	Eai	11	BG	5	1			5	1					
03 Jan	N06E37	151	250	11	Eko	10	BG	6				3						
04 Jan	N06E24	151	130	9	Dao	8	BG	2	2			1			1			
05 Jan	N06E11	150	100	7	Dai	11	BG	2				2						
06 Jan	N05W05	153	130	12	Eai	24	BG	4										
07 Jan	N05W20	154	100	11	Eai	18	BG	10				5	2					
08 Jan	N05W31	152	120	12	Eai	13	BG											
09 Jan	N06W42	151	170	11	Eao	13	BG	2										
10 Jan	N06W57	153	60	8	Dao	4	B	1										
11 Jan	N07W72	155	10	1	Axx	1	A											
								46	6	1	20	4	1	1	1	0		

Died on Disk.
 Absolute heliographic longitude: 153



Region Summary - continued

Date	Location		Sunspot Characteristics					Flares															
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
Region 3537																							
01 Jan	N19E64	150	plage										1										
02 Jan	N18E48	151	40	5	Cao	2	B	3															
03 Jan	N18E34	154	60	1	Cao	6	B	1															
04 Jan	N18E21	154	40	6	Dao	3	BG							1									
05 Jan	N18E03	159	50	2	Hsx	1	A																
06 Jan	N18W11	159	50	2	Cao	3	B																
07 Jan	N18W23	158	60	2	Hax	2	A																
08 Jan	N18W35	156	30	2	Hax	1	A																
09 Jan	N18W47	156	30	1	Hax	1	A																
10 Jan	N18W61	157	30	1	Hax	1	A																
11 Jan	N18W66	158	plage																				
12 Jan	N18W80	149	plage										1										
								6	0	0		1	0	0	0	0	0						

Crossed West Limb.
 Absolute heliographic longitude: 159

Region 3538																							
03 Jan	N21E11	177	30	3	Dao	5	B	3															
04 Jan	N21W02	177	30	5	Dri	8	BG	2					1										
05 Jan	N21W14	175	70	6	Dai	8	B																
06 Jan	N21W28	176	70	6	Dai	8	G	9				9	1										
07 Jan	N25W42	177	30	6	Cri	10	B	3				1											
08 Jan	N25W54	175	40	9	Cai	11	B	6				1											
09 Jan	N20W67	176	80	7	Cai	10	B	6				4											
10 Jan	N20W81	177	200	7	Cao	10	B	5	1			2											
								34	1	0		18	1	0	0	0							

Crossed West Limb.
 Absolute heliographic longitude: 177



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 3539																							
05 Jan	N10E25		136	10	1	Axx	2	A															
06 Jan	N11E14		134	60	5	Dsi	9	BG															
07 Jan	N11W01		135	30	5	Dri	7	BG					1										
08 Jan	N11W12		133	40	6	Cao	5	B	1										1				
09 Jan	N10W27		136	60	5	Dai	8	B															
10 Jan	N10W41		137	220	7	Dao	9	B															
11 Jan	N10W56		139	230	8	Dai	13	B	7	1			6										
12 Jan	N10W69		138	130	6	Dao	8	B	4				2										
13 Jan	N13W82		138	110	3	Cao	3	B															
14 Jan	N13W96		139	110	3	Cao	3	B	1														
									13	1	0	9	0	1	0	0							

Still on Disk.

Absolute heliographic longitude: 135

Region 3540

04 Jan	S18E81		94	plage									1										
05 Jan	S18E67		94	100	9	Dao	9	B	3														
06 Jan	S18E53		95	350	9	Dki	12	BG	2														
07 Jan	S17E47		92	310	11	Eki	17	BG	1				1										
08 Jan	S17E31		90	290	10	Dki	15	BG	1				1										
09 Jan	S18E18		91	240	9	Cao	14	B					1										
10 Jan	S18E04		92	240	9	Cao	14	B					1										
11 Jan	S18W10		93	150	8	Cao	12	B	1				2										
12 Jan	S17W22		91	60	7	Cao	8	B					1										
13 Jan	S18W37		93	80	8	Cai	13	B															
14 Jan	S19W51		94	110	10	Dai	16	BG															
									9	0	0	7	0	0	0	0	0						

Still on Disk.

Absolute heliographic longitude: 92



Region Summary - continued

Date	Location		Sunspot Characteristics				Flares											
	Lat CMD	Lon	Helio 10 ⁶ hemi.	Area	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical						
									C	M	X	S	1	2	3	4		
Region 3541																		
05 Jan	S21E65		96	10	2	Hax	1	A										
06 Jan	S21E51		97	30	2	Cao	4	B										
07 Jan	S20E43		94	60	2	Cao	3	B										
08 Jan	S20E29		92	50	3	Dai	3	B										
09 Jan	S21E17		92	80	6	Dai	5	B	2									
10 Jan	S23E07		89	60	13	Eai	24	BG										
11 Jan	S22W04		87	100	12	Esi	15	BG										
12 Jan	S22W22		91	50	9	Dai	12	BG	1				1					
13 Jan	S22W33		89	70	6	Dao	4	BD	1				4					
14 Jan	S22W48		91	50	5	Cso	4	B	5				2	1				
									9	0	0		7	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 87

Region 3542

05 Jan	N19E12		150	60	5	Dao	6	B										
06 Jan	N19W02		150	60	5	Cao	6	B										
07 Jan	N16W15		150	50	4	Cao	3	B										
08 Jan	N19W29		150	20	2	Hax	1	A	2				1					
09 Jan	N18W43		152	10	1	Axx	1	A										
10 Jan	N18W57		153	plage														
11 Jan	N18W71		154	plage														
12 Jan	N18W85		154	plage														
									2	0	0		1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 150

Region 3543

07 Jan	S05W21		155	50	7	Dai	8	B										
08 Jan	S05W34		155	80	6	Dai	12	B					1					
09 Jan	S06W48		157	110	8	Dso	8	B										
10 Jan	S06W63		159	110	8	Cso	8	B										
11 Jan	S06W78		161	50	9	Cso	4	B										
12 Jan	S05W91		160	plage														
									0	0	0		1	0	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 155



Region Summary - continued

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

Region 3547

11 Jan	N19E19	64	40	5	Dso	3	B										
12 Jan	N19E05	64	50	7	Cso	5	B		1		1						
13 Jan	N18W09	65	30	8	Cao	6	B										
14 Jan	N18W23	66	10	8	Bxo	2	B										
										0	1	0	1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 64

Region 3548

12 Jan	N12E41	28	90	4	Dso	5	B	2									
13 Jan	N12E28	28	70	4	Dao	5	B										
14 Jan	N12E14	29	40	4	Cao	5	B										
								2	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 29

Region 3549

12 Jan	S20E62	7	140	5	Dso	3	B										
13 Jan	S21E50	6	180	5	Dsi	7	B										
14 Jan	S21E36	7	250	6	Chi	7	B	2			1						
								2	0	0	1	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 7

Region 3550

12 Jan	S16E21	48	10	6	Bxo	3	B										
13 Jan	S18E09	47	10	1	Axx	1	A										
14 Jan	S18W03	46	10	2	Axx	3	A										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 46

Region 3551

12 Jan	N25E50	19	10	7	Bxo	3	B										
13 Jan	N26E39	17	10	3	Bxo	3	B										
14 Jan	N26E25	18	10	3	Bxo	3	B										
								0	0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 18



Region Summary - continued

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

Region 3552

12 Jan	S23W14	83	30	7	Cso	5	B										
13 Jan	S22W25	81	10	6	Cao	5	B										
14 Jan	S22W39	82	10	3	Axx	4	A										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 83

Region 3553

13 Jan	N05E68	348	120	1	Hsx	1	A										
14 Jan	N05E54	349	80	2	Hsx	3	A										
									0	0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 349



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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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