POSITIONS AND AREAS OF SUN SPOTS

[Communicated by Capt. J. F. Hellweg, U. S. Navy (Ret.) Superintendent, U. S. Naval Observatory. Data from measurements at the U. S. Naval Observatory from plates obtained at the observatories indicated. Difference in longitude is measured from the central meridian, positive toward the west. Latitude is positive toward the north. Areas are corrected for foreshortening and expressed in millionths of Sun's visible hemisphere. For each day, below longitude, latititude, area of spot or groups, and spot count, are given respectively the assumed longitude of the center of the disk, assumed latitude of the center of the disk, total area of spots and groups, and total spot count]

Date	Eastern standard time		Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1939	h	m		°	°	°	°				
July 1	8	36	6522	−38	43	−7	39	121	15	G	Mount Wilson.
			(*)	−25	56	−24	36	48	6		
			6517	−11	70	−22	26	242	5		
			6523	−1	80	+16	14	36	4		
			6514	+1	82	−22	25	48	2		
			6509	+16	97	−6	18	145	18		
			6519	+24	105	−15	29	364	20		
			6508	+31	112	+4	31	97	3		
			6507	+34	115	−3	35	24	6		
			6518	+51	132	−15	34	73	5		
					(81)	(+3)		1,198	84		
July 2	11	10	6525	−88	338	−4	88	388	5	F	U. S. Naval.
			6522	−25	41	−9	27	145	12		
			6517	−11	55	−27	31	36	9		
			6524	−1	65	+15	12	6	1		
			6517	+3	69	−22	24	218	5		
			6523	+13	79	+15	17	24	1		
			6514	+15	81	−22	28	36	3		
			6509	+30	96	−6	32	97	15		
			6519	+33	99	−17	38	97	10		
			6519	+40	106	−14	43	194	8		
			6507	+43	109	−3	44	48	8		
			6508	+44	110	+4	44	97	2		
			6518	+66	132	−12	68	48	3		
			6518	+67	133	−15	69	6	2		
					(66)	(+3)		1,440	84		
July 3	10	33	6527	−80	333	−17	81	242	5	G	U. S. Naval.
			6526	−78	335	+16	79	48	8		
			6525	−75	338	−4	75	1,212	23		
			6522	−17	36	−10	20	6	5		
			6522	−11	42	−9	15	85	12		
			6517	+3	56	−26	29	36	10		
			6524	+12	65	+15	16	97	14		
			6517	+15	68	−22	28	242	6		
			6514	+28	81	−22	37	36	3		
			6509	+43	96	−7	45	97	10		
			6519	+46	99	−17	50	85	6		
			6519	+53	106	−15	57	194	4		
			6507	+58	111	−4	59	6	2		
			6508	+58	111	+5	58	109	3		
					(53)	(+3)		2,495	111		
July 4	10	50	6527	−67	333	−17	69	485	15	G	Do.
			6526	−63	337	+16	65	48	9		
			6525	−62	338	−5	63	1,600	78		
			6528	−25	15	+7	26	6	1		
			6522	+2	42	−9	12	121	20		
			6517	+15	55	−26	32	12	6		
			6524	+26	66	+15	28	73	10		
			6517	+28	68	−22	37	242	4		
			6514	+40	80	−22	46	24	7		
			6509	+57	97	−7	58	61	5		
			6519	+60	100	−17	63	61	5		
			6519	+68	108	−15	70	194	1		
			6508	+71	111	+5	71	61	1		
					(40)	(+3)		2,988	162		
July 5	8	32	6527	−56	332	−18	60	485	25	F	Mount Wilson.
			6526	−51	337	+16	52	12	1		
			6525	−48	340	−5	49	1,600	95		
			6528	−38	350	+7	39	97	10		
			6522	+15	43	−9	18	97	15		
			6517	+25	53	−26	37	12	8		
			6517	+39	67	−22	45	242	3		
			6524	+40	68	+15	42	48	2		
			6514	+52	80	−22	58	12	3		
			6509	+69	97	−6	70	73	2		
			6509	+70	98	−7	71	36	2		
			6519	+72	100	−17	75	48	4		
			6519	+80	108	−15	81	170	2		
			6508	+83	111	+5	83	48	1		
					(28)	(+3)		2,980	173		
July 6	11	38	6529	−63	310	+19	65	24	1	VG	U. S. Naval.
			6527	−40	333	−17	42	388	25		
			6525	−34	339	−6	34	1,648	78		
			6528	−23	350	+6	23	109	15		
			(*)	+18	31	−1	18	16	3		
			6522	+27	40	−7	28	12	4		
			(*)	+30	43	−10	33	48	1		
			6517	+41	51	−26	49	48	4		
			6517	+54	67	−23	59	291	7		
					(13)	(+3)		2,584	138		

See footnotes at end of table.

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time		Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1939	h	m		°	°	°	°				
July 7	10	57	6529	−50	310	+20	51	12	1	F	U. S. Naval.
			6527	−27	333	−17	32	582	30		
			6525	−20	340	−6	22	1,939	90		
			6528	−8	352	+6	9	533	32		
			6530	+30	30	−2	30	16	4		
			6522	+40	40	−8	41	12	2		
			(*)	+42	42	−10	44	48	2		
			6517	+55	55	−26	61	24	2		
			6517	+68	68	−24	71	291	5		
					(360)	(+4)		3,457	168		
July 8	8	41	6532	−55	293	−16	58	16	2	F	Mount Wilson.
			6529	−38	310	+21	41	12	1		
			6531	−23	325	+17	26	12	2		
			6527	−13	335	−17	23	582	40		
			6525	−7	341	−5	10	1,454	75		
			6528	+5	353	+6	5	824	45		
			(*)	+20	8	+14	22	6	5		
			(*)	+22	10	+8	22	6	3		
			(*)	+35	23	+9	35	6	1		
			6522	+52	40	−8	53	12	1		
			6517	+78	66	−22	78	145	2		
					(348)	(+4)		3,075	177		
July 9	18	13	6532	−37	293	−17	41	48	8	F	Do.
			6527	+5	335	−17	22	582	55		
			6525	+12	342	−5	15	1,454	150		
			6528	+23	353	+6	23	1,164	95		
			6533	+37	7	+11	37	12	2		
					(330)	(+4)		3,260	310		
July 10	10	45	6532	−27	293	−17	32	48	11	VG	U. S. Naval.
			6527	+16	336	−17	25	582	56		
			6525	+21	341	−6	23	1,357	95		
			6528	+34	354	+6	33	1,164	80		
			6533	+47	7	+11	47	36	5		
					(320)	(+4)		3,187	247		
July 11	11	25	6535	−83	224	+17	81	1,164	96	G	Do.
			6532	−13	294	−18	25	170	24		
			6527	+30	337	−17	36	436	39		
			6525	+36	343	−6	38	1,115	75		
			6528	+48	355	+6	48	1,309	45		
			6534	+55	2	−17	58	24	6		
					(307)	(+4)		4,218	285		
July 12	11	4	6539	−85	209	+17	84	145	1	VG	Do.
			6535	−76	218	+17	74	48	3		
			6535	−69	225	+17	68	970	14		
			6538	−30	264	−8	32	6	2		
			6532	0	294	−18	22	133	18		
			6537	+2	296	+21	17	6	2		
			6536	+13	307	+18	20	73	9		
			6527	+40	334	−17	45	291	25		
			6525	+50	344	−6	50	921	45		
			6528	+61	355	+6	60	1,309	35		
			6534	+70	4	−16	72	6	1		
					(294)	(+4)		3,908	155		
July 13	11	17	6539	−71	209	+17	70	145	3	VG	Do.
			6535	−62	218	+17	62	48	3		
			6535	−55	225	+17	56	873	20		
			6540	−41	239	−15	45	24	6		
			6538	−19	261	−10	23	48	8		
			6532	+15	295	−18	26	48	12		
			6536	+27	307	+18	30	48	10		
			6527	+53	333	−17	56	194	9		
			6525	+63	343	−6	64	533	25		
			6528	+75	355	+6	74	1,212	20		
					(280)	(+4)		3,173	116		
July 14	11	8	6541	−74	193	+20	72	679	14	VG	Do.
			6539	−57	210	+17	58	145	2		
			6535	−48	219	+18	49	24	2		
			6535	−41	226	+18	43	388	35		
			6540	−26	241	−15	31	6	3		
			6538	−5	262	−9	14	97	11		
			6536	+40	307	+18	42	73	9		
			6527	+68	335	−18	70	145	6		
			6525	+76	343	−7	76	388	12		
			6528	+85	352	+5	85	485	7		
					(267)	(+4)		2,430	101		
July 15	10	48	6541	−62	192	+20	63	485	10	F	Do.
			6539	−44	210	+17	45	109	1		
			6535	−29	225	+17	32	824	15		
			6542	−20	234	+13	22	61	8		
			6538	+9	263	−10	15	97	12		
			6536	+53	307	+19	54	61	2		
			6527	+88	342	−17	89	145	1		
			6525	+88	342	−7	88	145	1		
					(254)	(+4)		1,927	50		

POSITIONS AND AREAS OF SUN SPOTS—Continued

Date	Eastern standard time	Mount Wilson group No.	Heliographic: Difference in longitude	Heliographic: Longitude	Heliographic: Latitude	Heliographic: Distance from center of disk	Area of spot or group	Spot count	Plate quality	Observatory
1939	h m		°	°	°	°				
July 16	11 38	6541	−48	193	+20	50	582	4	F	U. S. Naval.
		6539	−30	211	+17	32	109	1		
		6535	−16	225	+17	20	873	14		
		6542	−7	234	+13	11	242	16		
		6538	+20	261	−10	25	12	4		
		6536	+67	308	+19	69	12	2		
				(241)	(+4)		1,830	41		
July 17	10 53	6541	−35	193	+20	37	630	11	G	Do.
		6539	−17	211	+17	20	97	1		
		6535	−3	225	+17	12	679	12		
		6542	+7	235	+14	12	339	15		
		6538	+32	260	−10	35	12	2		
				(228)	(+5)		1,757	41		
July 18	8 36	6541	−24	192	+20	28	727	25	VG	Mount Wilson.
		6539	−6	210	+17	14	145	12		
		6535	+10	226	+17	16	679	45		
		6542	+20	236	+15	23	582	42		
				(216)	(+5)		2,133	124		
July 19	10 46	6541	−10	191	+20	18	679	45	VG	U. S. Naval.
		6539	+8	209	+17	15	145	16		
		6544	+22	223	−13	29	24	7		
		6535	+24	225	+17	26	679	35		
		(*)	+31	232	+25	36	24	8		
		6542	+35	236	+13	36	776	45		
				(201)	(+5)		2,327	156		
July 20	8 43	6546	−81	108	−12	82	48	1	VG	Mount Wilson.
		6545	−41	148	−9	44	97	10		
		6541	+3	192	+20	16	727	40		
		6539	+21	210	+17	24	145	12		
		6544	+36	225	−13	40	36	5		
		6535	+37	226	+17	38	679	20		
		6542	+45	234	+13	46	776	30		
				(189)	(+5)		2,508	118		
July 21	15 34	6547	−73	99	+6	75	97	1	G	U. S. Naval.
		6546	−65	107	−14	68	36	1		
		6545	−24	148	−9	27	170	12		
		6541	+20	192	+19	25	679	35		
		6539	+39	211	+17	41	145	10		
		6535	+52	224	+17	53	485	9		
		6542	+66	238	+13	68	339	15		
				(172)	(+5)		1,951	83		
July 23	9 10	6547	−48	101	+7	48	97	8	F	Mount Wilson.
		6546	−39	110	−13	43	24	1		
		6545	+3	152	−8	13	436	28		
		6541	+44	193	+20	46	291	26		
		6539	+62	211	+17	64	73	10		
		6535	+78	227	+17	78	339	4		
		6542	+85	234	+13	85	48	2		
				(149)	(+5)		1,308	79		
July 24	10 35	6547	−35	100	+7	35	73	1	F	U. S. Naval.
		6546	−25	110	−14	31	12	4		
		6545	+15	150	−8	20	436	20		
		6541	+57	192	+19	59	97	11		
		6539	+70	205	+17	72	12	1		
		6548	+78	213	+4	79	6	1		
				(135)	(+5)		636	38		
July 25	11 48	6550	−61	60	−22	66	36	2	F	Do.
		6547	−20	101	+6	20	97	3		
		6546	−14	107	−16	25	6	1		
		6549	−7	114	−6	12	48	4		
		6545	+30	151	−9	33	679	19		
		6541	+70	191	+19	72	12	2		
				(121)	(+5)		878	31		
July 26	13 9	6550	−48	59	−22	54	36	6	VG	Do.
		6547	−7	100	+6	7	121	8		
		6549	+7	114	−5	11	36	3		
		6545	+44	151	−9	46	727	36		
				(107)	(+5)		920	53		
July 27	11 7	6550	−33	62	−22	42	24	1	VG	Do.
		6547	+8	103	+6	9	121	4		
		(*)	+21	116	+15	23	6	1		
		6549	+22	117	−5	24	61	3		
		6545	+56	151	−9	58	727	34		
				(95)	(+5)		939	43		
July 28	11 20	6553	−83	359	+8	83	776	1	G	U. S. Naval.
		6552	−19	63	−22	32	36	2		
		6550	−9	73	−24	29	73	7		
		6547	+23	105	+6	23	73	1		
		6549	+37	119	−5	38	48	4		
		6551	+43	125	−32	55	145	14		
		6545	+71	153	−9	73	824	20		
				(+82)	(+5)		1,975	49		
July 29	11 6	6553	−69	0	+8	71	630	1	VG	Do.
		6554	−24	45	−17	33	6	4		
		6550	−4	65	−23	29	36	6		
		6547	+37	106	+7	37	61	5		
		6549	+50	119	−4	51	36	6		
		6551	+56	125	−33	68	436	11		
		6545	+85	154	−9	86	533	4		
				(69)	(+6)		1,738	37		
July 30	9 15	6553	−57	0	+8	58	582	7	G	Mount Wilson.
		6554	−12	45	−17	25	12	2		
		6555	−5	52	−19	26	12	2		
		6552	+3	60	−20	26	12	2		
		6550	+15	72	−23	32	97	10		
		6547	+50	107	+7	50	48	1		
		6551	+63	120	−33	73	97	2		
		6549	+64	121	−3	65	24	1		
		6551	+73	130	−30	80	170	2		
				(57)	(+6)		1,054	29		
July 31	10 51	6557	−85	318	+14	85	339	3	G	U. S. Naval.
		6556	−67	336	−15	70	194	12		
		6553	−43	0	+8	43	582	4		
		6555	+14	57	−22	30	12	3		
		6552	+19	62	−19	31	48	8		
		6550	+29	72	−23	41	145	15		
		6547	+64	107	+6	64	48	1		
		6551	+77	120	−32	83	24	2		
		6549	+77	120	−3	78	6	1		
				(43)	(+6)		1,398	49		

Mean daily area for 30 days=2,189.

* Not numbered.

Plate quality: P, poor; F, fair; G, good; VG, very good.

PROVISIONAL SUNSPOT RELATIVE NUMBERS FOR JULY 1939

[Dependent alone on observations at Zurich]

[Data furnished through the courtesy of Prof. W. Brunner, Eidgen, Sternwarte, Zurich Switzerland]

July 1939	Relative numbers	July 1939	Relative numbers	July 1939	Relative numbers
1	103	11	*d* 131	21	106
2	*a* 97	12	118	22	--------
3	*dd* 112	13	101	23	*a* 80
4	*Ec* 128	14	*d* 97	24	67
5	130	15	*Mc* 87	25	62
6	122	16	--------	26	53
7	151	17	*ab* 85	27	*a* 51
8	*ab* 167	18	86	28	*Wcd* 58
9	*ab* 130	19	*a* 95	29	*Mc* 71
10	143	20	*Ebc* 113	30	68
				31	47

Mean, 29 days 98.6.

a=Passage of an average-sized group through the central meridian.
b=Passage of a large group through the central meridian.
c=New formation of a group developing into a middle-sized or large center of activity: *E*, on the eastern part of the sun's disk; *W*, on the western part; *M*, in the central circle zone.
d=Entrance of a large or average-sized center of activity on the east limb.