

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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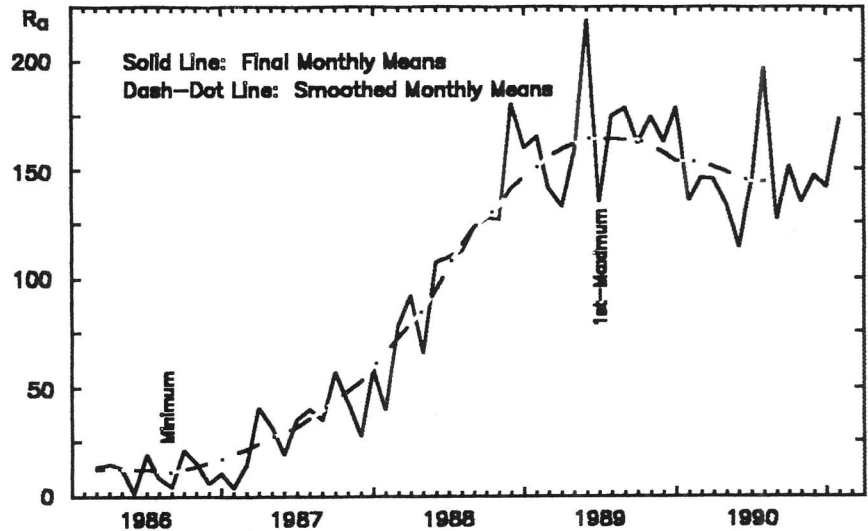
Volume 47 Number 2

February 1991

American Relative Sunspot Numbers for February

R _a Final		
1) 212	11) 136	21) 230
2) 192	12) 151	22) 219
3) 167	13) 179	23) 210
4) 149	14) 187	24) 188
5) 131	15) 176	25) 201
6) 122	16) 167	26) 187
7) 118	17) 150	27) 179
8) 113	18) 191	28) 160
9) 129	19) 213	
10) 136	20) 216	

Mean: 171.8
 Number of contributors: 105



Relative sunspot numbers and solar 10.7 centimeter radio flux values steadily declined during the first week of February, but flare activity was in the moderate and high range. No less than thirty-four M-level x-ray solar flares were recorded, and three were major events. The latter flares included a M6.8/1N on the 4th in SESC Region 6469 (S13, L184, Fki on 3 February) and a M8.8/1F on the 7th in Region 6471 (S12, L143, Fki on 6 February), which was followed by a M5.3/SN in Region 6487 (N15, L011, Dko on 8 February). The first two of these spot-groups were also responsible for a majority of the remaining M-class events, accounting for twenty of these flares between them. The > 10 MeV proton event and polar cap absorption which began on 31 January ended on 1 February.

Solar activity began the following week in the high range after the occurrence of another major flare (M7.2/SF) on the 8th; a result of activity in Region 6471. (Region 6471 rotated over the western limb more than a day earlier.) Thereafter, activity declined to low and moderate. Four additional M-level solar flares were detected during the week, and relative sunspot numbers continued to be fairly high.

Activity was moderate to low during the third week of February; ten solar flares reached M-level intensity during the period. In general these events occurred in mature spot clusters, although two were associated with Region 6495 (S03, L323), a small Bxo-type group. At ~1320 millionths solar hemisphere, Region 6509 (S21, L197, Eki on 21 February) was the largest region on the disk. The solar 10.7 centimeter radio flux rate climbed above 300 on the final day of the week, reflecting the large number of well-developed groups which were present on the Sun's visible hemisphere.

During the remainder of the month activity was mainly low with one day in the high range. One X-level, and three M-class solar flares were recorded during the final week of February. Region 6497 (S11, L265, Dao on 24 February) produced the strongest flare of the month, a X1.2/2N, as it exited the western limb on the 25th. A small proton event also took place on the 25th, a likely result of this activity. Single M-level events occurred in Southern Hemisphere Regions 6504, 6516 and 6517. Region 6509 continued to be the largest spot-group on the disk, attaining a maximum area of 1430 millionths solar hemisphere on the 23rd.

One X-level, and fifty-two M-class x-ray solar flares were recorded during February. A large majority of these events occurred in the Sun's Southern Hemisphere. Sunspot and solar flare activity was strongly centered in this hemisphere during the month; so much so in fact, that a new peak in the smoothed relative sunspot number (August 1990) for the Southern Hemisphere was attained. This index reached a maximum in the Northern Hemisphere during June 1989, just one month prior to the tentative maximum for cycle twenty-two. The overall smoothed-mean for August remained at the July level of 143.4.

The estimated mean American Relative Sunspot Number for 1-14 March is 145. The Sun has been very active during much (continued)

of early to mid-March. Eleven X-class, and forty M-level x-ray solar flares have been recorded thus far during the month. Many of these events were detected during the first nine days of March; however, X-class activity has continued throughout the period.

A portion of this information was obtained from the SELDADS data base.

Sudden Ionospheric Disturbances Recorded During January 1991
Records were received from A1,3,9,19,40,50,52,59,61,62,63,64,65,66,67,68,69,70,71.

Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def
1	0830	1-	4	13	2101	2+	5	21	1738	1-	5	28	0928	1	
2	1445	1-	4	14	0808	1+	4	21	1859	2	5	28	1247	1+	
4	0711	1+	4	14	1713	1-	4	21	2022	1+	5	28	1406	1	
4	1127	1-	4	14	1736	1+	4	21	2101	1	5	28	1543	1	
4	1337	1-	4	14	1839	1-	4	21	2116	2+	5	28	1631	1+	
4	1814	1-	5	15	0802	1-	4	22	0548	2+	5	28	1706	1-	
5	1202	1+	5	15	0824	2	5	22	0750	2+	4	28	1736	1	
5	1956	1-	4	15	1012	1-	4	22	1318	2	5	28	1759	2	
6	0915	1-	4	15	1426	1	5	22	1525	2+	5	28	1831	1-	
6	1615	3+	5	15	1738	1-	3	22	1806	2	5	28	1957	2+	
6	1706	1-	4	15	2212	1	5	22	1952	3+	5	28	2101	2	
6	1735	1	4	16	2025	1	5	23	0818	1-	5	28	2143	1	
7	1315	2+	5	16	2245	1-	4	23	1116	1-	4	28	2206	1+	
7	1334	1	4	17	0845	1-	4	23	1321	1	4	29	0653	2+	
7	1415	2	4	17	1228	1-	4	23	1441	1+	5	29	0748	1	
7	1741	1-	4	17	1302	1-	5	23	1510	1	5	29	1016	2+	
7	1919	1	4	17	1416	1-	5	23	1742	1	4	29	1216	1-	
8	0425	2+	5	17	1453	1-	4	23	1821	2	5	29	1314	1-	
8	0651	2+	4	17	1501	2+	5	24	0324	2+	5	29	1348	1	
8	1125	2+	5	17	1854	1	4	24	0815	1-	4	29	1420	1	
8	1607	1	5	17	2118	1	5	24	1229	1+	5	29	1435	1-	
8	1759	1-	4	18	0405	2+	4	24	1449	1-	4	29	1458	2+	
8	1832	2+	5	18	0828	1	4	25	0250	2+	4	29	1609	1-	
8	2034	1+	5	18	0955	2	5	25	0458	1	5	29	1726	1	
8	2203U	2+	5	18	1306	1+	5	25	0633	3+	5	29	1756	2+	
9	0634	1+	4	18	1409	1+	5	25	1110	1-	4	29	1845	2	
9	0810	2+	4	18	1548	1	5	25	1331	2	5	29	2008	1	
9	1336	1	4	19	1134	2	5	25	1445	1	4	29	2207	1-	
10	0448	1	4	19	1322	1	5	25	1724	2	5	29	2236	1	
10	0705	2+	4	19	1347	1+	5	25	1901	1-	5	30	0105	2	
10	0932	1+	5	19	1434	1+	5	25	1939	1	5	30	0858	2+	
10	1415	1+	5	19	1607	1-	5	25	2010	1	4	30	1350	1-	
10	1515	1-	3	19	1757	1	5	26	0845	1	5	30	1401	1-	
10	1528	1-	5	19	1848	2	5	26	0908	1-	4	30	1422	1-	
10	1715	1-	5	19	1956	1	5	26	1343	1-	5	30	1432	1-	
11	0520	2	4	19	2038	2	5	26	1409	1	5	30	1445	1	
11	0658	2+	4	19	2147	2	5	26	1513	1	5	30	1514	2+	
11	0751	2+	5	19	2358	2	5	26	1720	2+	5	30	1559	1	
11	0859	1+	5	20	0720	2	5	26	1850	1+	5	30	1616	1+	
11	1528	1+	5	20	0924	1+	5	26	1928	1	5	30	1706	1+	
11	1544	3	5	20	1345	1+	5	26	2117	1+	5	30	1758	2	
11	1829	2+	5	20	1537	1	5	27	0009	2	4	30	1916	1	
11	1924	1-	4	20	2054	2+	5	27	0107	1	4	30	2000	1+	
11	2009	1-	4	20	2252	1+	5	27	0335	1+	4	30	2219	1	
11	2025	2	5	21	0019	1-	5	27	0536	1	5	30	2238	1-	
12	0712	1	4	21	0028	2+	5	27	0815	2	5	30	2258	1	
12	0825	1-	5	21	0638	2	5	27	0856	1	5	31	1153	2+	
12	0830	1+	5	21	0822	2	5	27	1005	1-	5	31	1332	1	
12	1245	1+	5	21	0918	1-	5	27	1152	1+	4	31	1615	1	
12	1413	1-	4	21	1117	2+	4	27	1448	1	5	31	1630	1+	
12	1438	1+	4	21	1158	1	5	27	1529	1+	5	31	1803	2	
12	1613	1-	4	21	1250	1+	5	27	1544	2+	5	31	1944	1-	
12	1910	2	4	21	1355	2+	5	28	0755	2+	5	31	2030	2	
12	2107	1+	5	21	1507	1+	5	28	0914	1	4	31	2127	1-	
12	2215	1	5	21	1534	1	5								

U = Maximum undefined after listed time.

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