Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

Peter O. Taylor, Editor
P.O. Box 5685
Athens, GA 30604-5685 USA

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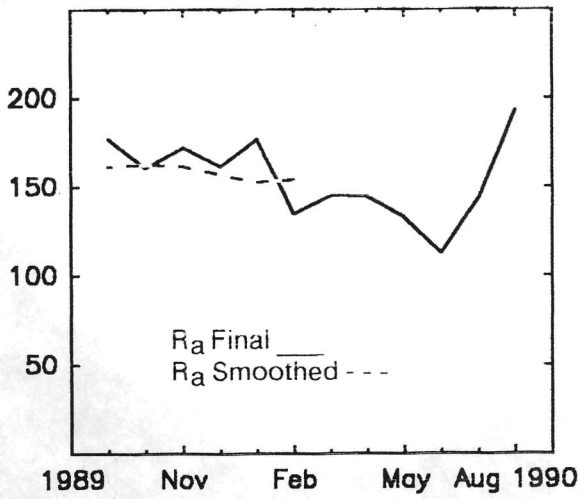
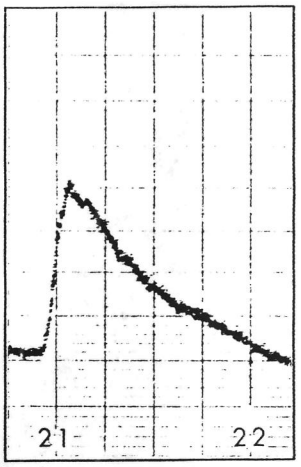
American Relative Sunspot Numbers for August

	R_a Final	
1) 149	11) 162	21) 262
2) 151	12) 175	22) 249
3) 142	13) 182	23) 266
4) 131	14) 210	24) 275
5) 125	15) 218	25) 241
6) 116	16) 226	26) 217
7) 121	17) 262	27) 194
8) 125	18) 273	28) 163
9) 145	19) 277	29) 172
10) 161	20) 280	30) 177
		31) 152

Mean: 193.5
Number of contributors: 105





Solar activity began the month in the moderate range with the eruption of a M1.6/SN x-ray flare on the 1st, in SESC Region 6172 (S24, L081, Eai on 1 Aug). A slight polar cap absorption occurred on 1-2 August as a likely result of the M4/2B flare which took place in Region 6180 on 30 July. Thereafter, activity was mainly low until 10 August.

On the 10th, activity entered the high range after the occurrence of a M7.9/2B solar flare in Region 6203 (N18, L209, Eao on 11 Aug), a spot-group with reversed magnetic polarity. Two low-level M-class events were recorded on the 13th, in Regions 6199 (N12, L228, Eai on 13 Aug) and 6197 (N14, L241, Dao on 13 Aug). Sunspot numbers began to rise rapidly during mid-August; nineteen separate spot groups were present on the visible hemisphere on the 16th.

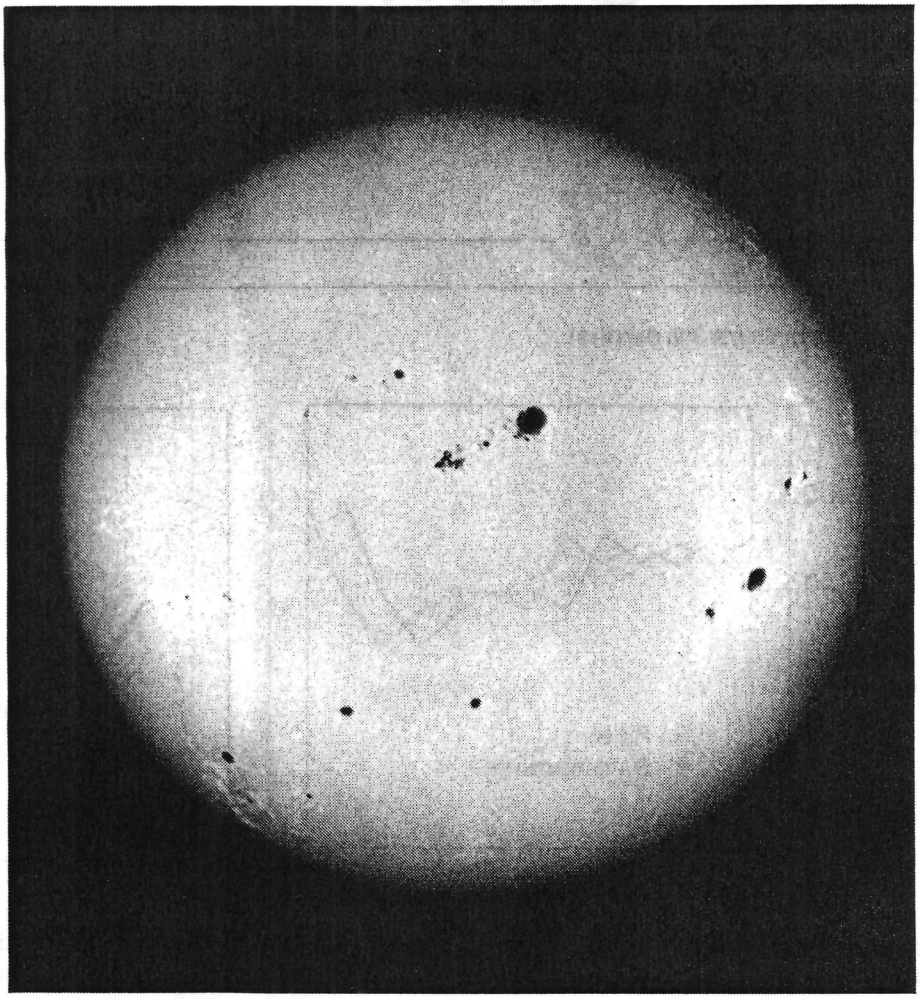
The following week saw some of the highest relative sunspot numbers to occur during cycle twenty-two, although flare activity was fairly low. Three low-level M-class x-ray flares were recorded between the 17th and 23rd. These included a M1.1/SF on the 17th from Region 6216 (N08, L200, Dai on 17 Aug), followed by a M1.0/1F in Region 6223 (S13, L100, Eko on 21 Aug) and a M1.1/SF from Region 6226 (S22, L095, Eki on 21 Aug) on the 21st. By the 18th, the number of spot-groups on the disk had grown to twenty-four, the most to appear on any day during August. Later in the period, each of three of these clusters grew to encompass an area of just over 1000 millionths solar hemisphere (~ 3 billion km^2), creating a spectacular visual appearance in both white and hydrogen-alpha light. All of these spot groups, Regions 6214 (S12, L168, Eki on 22 Aug), 6223 and 6226, were located in the Sun's Southern Hemisphere.

Relative sunspot numbers slowly declined during the remainder of August, but flare activity increased dramatically. One X-class, and eighteen M-level solar flares occurred from the 24th through the 31st, bringing the totals for August to one X-class, and twenty-six M-level events. The lone X-level flare (X3.0/2B) was spawned by Region 6233 (N14, L031, Fki on 27 Aug) on the 27th. This flare was the strongest x-ray event to erupt since the powerful X9.3/1B flare by Region 6063 (N34, L311) on 24 May. The SID which resulted from the August event is shown above. Region 6233 was the most magnetically-complex (beta-gamma-delta) group on the visible hemisphere during the final week of the month. In addition to the X-level flare this region was responsible for eleven M-class, and a number of smaller flares. Region 6227 (S25, L082, Dao on 21 Aug) also produced a major flare during the period, a M5.2/2B on the 26th.

The high relative sunspot numbers which occurred during mid-month and corresponding high mean for August caused the smoothed-mean spot number for February 1990 to rise from the January value (152.7) to 153.9. The solar 10.7 centimeter radio flux and background x-radiation levels were at 182 and C1.0 on the final day of the month.

The estimated mean American sunspot number for 1-15 September is 135. Activity has been in the low and moderate range, but began to increase at mid-month. Thus far nine solar flares have reached M-level intensity during September.

A portion of this information was obtained from: SESC PRF, Numbers 779-83 (1990).



The photograph to the left shows the Sun as it appeared on 25 July 1990. Sixteen separate spot-groups were present on the visible hemisphere on the 25th, typical for this phase of the sunspot cycle. The large cluster located near the north-central meridian is SESC Region 6162 (N11, L143, Fhi on 25 July) which attained its maximum size on this day, encompassing an area of 900 millionths solar hemisphere, or ~2.7 billion km^2. Although the trailer portion of Region 6162 developed a delta magnetic configuration on the 25th-26th, only one M-level flare occurred in the region before it rotated over the western limb on 31 July. Note that the Sun's North Pole (North to the top, West to the right) is tilted towards the Earth in this fine photograph by our French collaborator Dr. Jean Dragesco, who utilized a f/12 refracting telescope of 178 millimeters aperture to obtain this exceptional view.

Sudden Ionospheric Disturbances Recorded During July 1990

Records were received from A1,9,19,40,50,52,61,62,63,64,65,66,67,68,69,70,71.

Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp
1	1231	1+	5	3	1535	1-	4	11	0636	2+	4	22	2204	2+
1	1402	1-	5	4	1626	1-	4	11	0913	2+	5	23	1239	1+
1	1630	1+	5	4	1653	2+	5	12	1347	2+	5	23	1925	2
1	1836	2	4	4	1741	2+	5	12	1545	2+	5	23	2011	1-
1	1935	1+	5	5	1355	2	5	13	0737	2+	5	23	2158	2+
1	2035	1+	5	5	2016	1+	5	13	1116	3+	4	24	0622	1
2	0637	1	4	6	0555	2+	5	17	1649	1-	5	24	1628	1-
2	1225	2+	5	6	1831	1-	5	17	1714	1	5	24	1724	1-
2	1555	1	5	7	1343	1+	5	18	0630	2+	5	25	1327	1+
2	1805	1	5	8	1246	2	4	18	1307	1+	5	25	1437	1-
2	1845	2+	4	9	1245	1	5	18	1736	2	5	25	1519	2+
2	1936	1+	5	9	1621	2	5	18	2055	1-	4	25	2305	2+
2	2113	2	5	9	1823	2	5	20	1413	1+	5	26	1703	2
3	0603	1+	5	9	2216	2	5	21	2014	2	5	26	2124	1-
3	0954	2+	4	10	0650	2	5	22	1725	1+	4	27	0002	2
3	1325	2+	5	10	1231	1-	4	22	1810	2	4	30	0708	2+
3	1446	2+	5	10	1420	1	4	22	2132	1-	4			

SID Analysts: J. Knight; W. Morris; D. Overbeek; A. Stokes; P. Taylor; A. Voorvelt; B. Wingate

SPAN: SELVAX::ptaylor **TELEX:** [3762848] TO: EASYPLEX:74270,1516 **FAX:** [USA] 404-353-2336
INTERNET: ptaylor%SELVAX.span@ames.arc.nasa.gov **COMPUSERVE:** 74270,1516

(**Note:** Network collaborators should utilize these reporting facilities whenever possible.)