

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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



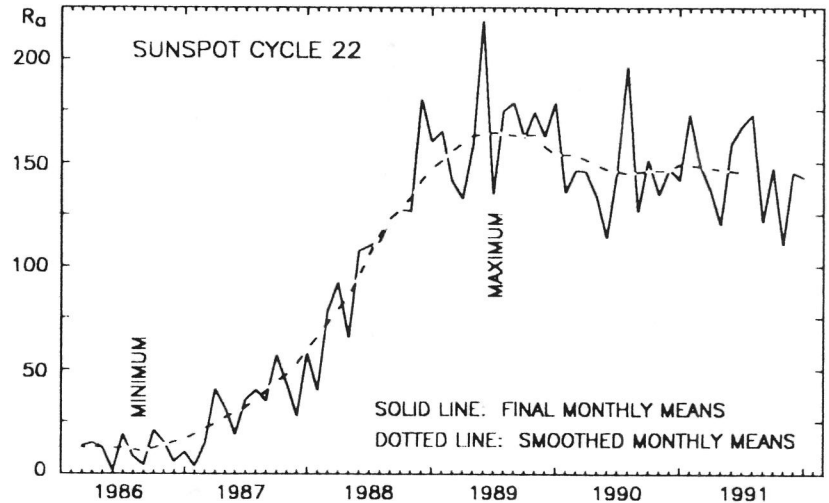
Volume 48 Number 1

January 1992

American Relative Sunspot Numbers for January

| R_a Final | | |
|-------------|---------|---------|
| 1) 143 | 11) 137 | 21) 139 |
| 2) 131 | 12) 120 | 22) 124 |
| 3) 161 | 13) 131 | 23) 111 |
| 4) 179 | 14) 99 | 24) 115 |
| 5) 170 | 15) 75 | 25) 121 |
| | | |
| 6) 176 | 16) 80 | 26) 124 |
| 7) 193 | 17) 64 | 27) 154 |
| 8) 199 | 18) 83 | 28) 176 |
| 9) 164 | 19) 92 | 29) 210 |
| 10) 151 | 20) 115 | 30) 231 |
| | | 31) 233 |

Mean: 142.0
 Number of reports: 98



Solar activity was moderate and high during the first nine days of January. Twenty-six class M flares occurred, including three major events. These consisted of a M5.8/1F in NOAA/USAF Region 6993 (S09, L346, EKI) and M5.1/1N Tenflare in Region 6985 (S17, L097, FKI) on the 1st, and a M5.4/1N on the 9th in Region 6994 (S16, L341, FKI). A majority of the remaining class M flares also took place in Region 6993 or Region 6994. These spot-groups were in close proximity to one another, and some interaction between the two was noted. A satellite level proton enhancement was recorded on the 4th, and a sudden impulse (SI) early on the 8th. However, the geomagnetic field generally exhibited quiet to unsettled conditions throughout the period.

Only five class M flares were recorded between the 10th and 23rd, and none were major events. An eruptive prominence extending outward to 0.22 solar radii was observed near the solar equator on the 21st, and several small filaments disappeared during the interval. A SI was recorded late on the 9th followed by geomagnetic storm conditions on the 10th, possibly linked to the major flare in Region 6994. Otherwise, the magnetic field continued to be quiet or unsettled with a few short periods of minor storming at high latitudes.

Low activity was the rule from the 24th to 29th, with the exception of the 26th, when Region 7012, a simple type B sunspot group located in the Sun's Southern Hemisphere, spawned the month's only class X flare, a X1.0/3B Tenflare. (It is somewhat unusual for a small undeveloped spot group such as Region 7012 to produce an event of this intensity.) A SI was recorded just before this flare, but its source was uncertain. A second SI occurred later on the 26th.

Both spot and solar flare activity accelerated during the final two days of January. Five class M flares were recorded on the 30th and two on the 31st. A majority of these - including a M4.9/2B Tenflare - occurred in Region 7031 (S05, L028, EKI), the largest group on the visible hemisphere during the final week of the month. Isolated instances of minor geomagnetic storming took place during the period, but in general conditions remained at the quiet to unsettled level. The final smoothed monthly-mean American Relative Sunspot Number for July 1991 is 144.4. The final yearly mean for 1991 (an average of the daily values) is 144.3.

The estimated mean American Relative Sunspot Number for 1-14 February is 180. Two major flares have occurred during this interval; both were class M events.

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

SPAN: 9555::ptaylor INTERNET: ptaylor%SELVAX.dnet@east.gsfc.nasa.gov FAX: [USA] 404-353-2336
 NOTE: Network contributors are urged to submit their reports via these services whenever possible.

Sudden Ionospheric Disturbances (SES) Recorded During December 1991

Records were received from A3,9,40,50,52,59,61,62,63,64,65,66,67,68,69,70,71,72,73,74.

| Day | Max | Imp | Def | Day | Max | Imp | Def | Day | Max | Imp | Def | Day | Max | Imp | Def |
|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|
| 1 | 0434 | 1+ | 4 | 9 | 0739 | 1 | 5 | 15 | 1358 | 1 | 5 | 25 | 1301 | 2 | 5 |
| 1 | 1904 | 1+ | 5 | 9 | 0823 | 1+ | 5 | 15 | 1422 | 1- | 5 | 25 | 1425 | 1- | 5 |
| 2 | 0935 | 2 | 5 | 9 | 0944 | 2+ | 5 | 15 | 1430 | 1- | 5 | 25 | 1442 | 1+ | 5 |
| 2 | 1143 | 1- | 5 | 9 | 1212 | 1 | 5 | 15 | 1530 | 1 | 5 | 25 | 1500 | 2+ | 5 |
| 2 | 1217 | 2 | 5 | 9 | 1246 | 1 | 5 | 15 | 1800 | 1 | 5 | 26 | 0428 | 1 | 5 |
| 2 | 1304 | 1 | 5 | 9 | 1316 | 1+ | 5 | 15 | 1832 | 2 | 5 | 26 | 0454 | 1 | 5 |
| 2 | 1411 | 1+ | 5 | 9 | 1347 | 2 | 5 | 15 | 1921 | 1- | 5 | 26 | 0620 | 1- | 5 |
| 2 | 1503 | 2 | 5 | 9 | 1429 | 1 | 5 | 15 | 1940 | 1- | 5 | 26 | 0635 | 2+ | 5 |
| 2 | 1749 | 1 | 5 | 9 | 1534 | 1 | 5 | 15 | 2000 | 1 | 5 | 26 | 0732 | 2 | 5 |
| 2 | 1846 | 2+ | 5 | 9 | 1707 | 1 | 5 | 15 | 2120 | 1- | 5 | 26 | 0840 | 1 | 5 |
| 2 | 1932 | 2 | 5 | 9 | 1731 | 1- | 5 | 16 | 1204 | 1 | 5 | 26 | 0942 | 2+ | 5 |
| 2 | 2008 | 1- | 5 | 9 | 1751 | 1+ | 5 | 16 | 1312 | 1- | 5 | 26 | 1048 | 1 | 5 |
| 2 | 2313 | 1- | 5 | 9 | 1809 | 1 | 5 | 16 | 1515 | 2 | 5 | 26 | 1210 | 1- | 5 |
| 2 | 2340 | 1+ | 5 | 9 | 1854 | 1- | 5 | 16 | 1924 | 1- | 5 | 26 | 1230 | 1- | 5 |
| 3 | 1637 | 2+ | 5 | 9 | 1914 | 1 | 5 | 16 | 1945 | 2+ | 5 | 26 | 1335 | 1 | 5 |
| 4 | 1436 | 2 | 5 | 9 | 2001 | 1+ | 5 | 16 | 2207 | 1- | 5 | 26 | 1433 | 1 | 5 |
| 4 | 1750 | 2+ | 5 | 9 | 2155 | 2+ | 5 | 17 | 0625 | 2+ | 5 | 26 | 1500 | 1- | 5 |
| 5 | 0130 | 1- | 5 | 10 | 0107 | 1+ | 5 | 17 | 1520 | 2 | 5 | 26 | 1609 | 1- | 5 |
| 5 | 0235 | 1+ | 4 | 10 | 0403 | 1+ | 5 | 17 | 1721 | 2 | 5 | 26 | 1719 | 2 | 5 |
| 5 | 0734 | 2 | 5 | 10 | 0750 | 1+ | 5 | 17 | 1940 | 2 | 5 | 26 | 1833 | 1- | 5 |
| 5 | 1100 | 2 | 5 | 10 | 0814 | 1- | 5 | 18 | 1027 | 2+ | 5 | 26 | 2035 | 1- | 5 |
| 5 | 1155 | 2 | 5 | 10 | 0855 | 1 | 5 | 18 | 1221 | 1 | 5 | 26 | 2045 | 1+ | 5 |
| 5 | 1306 | 2 | 5 | 10 | 0908 | 1 | 5 | 18 | 1334 | 1+ | 5 | 26 | 2142 | 1+ | 5 |
| 5 | 1407 | 1- | 5 | 10 | 1100 | 1 | 4 | 18 | 1654 | 2 | 5 | 27 | 0310 | 1+ | 5 |
| 5 | 1619 | 1- | 4 | 10 | 1122 | 1 | 5 | 18 | 2207 | 1 | 5 | 27 | 0615 | 2 | 5 |
| 5 | 1717 | 1- | 5 | 10 | 1154 | 1- | 5 | 19 | 1308 | 1- | 5 | 27 | 0914 | 1 | 5 |
| 5 | 1951 | 1- | 5 | 10 | 1252 | 1 | 5 | 19 | 1908 | 1- | 5 | 27 | 1110 | 1 | 5 |
| 5 | 2013 | 1+ | 5 | 10 | 1428 | 1- | 5 | 19 | 1950 | 1 | 5 | 27 | 1633 | 1 | 5 |
| 6 | 0449 | 1+ | 5 | 10 | 1552 | 1- | 5 | 20 | 1405 | 3 | 5 | 27 | 1720 | 3 | 5 |
| 6 | 1148 | 1- | 5 | 10 | 1634 | 1+ | 5 | 20 | 1901 | 1+ | 5 | 28 | 0909 | 1- | 5 |
| 6 | 1225 | 1 | 5 | 10 | 1815 | 1+ | 5 | 21 | 0420 | 2+ | 5 | 28 | 0952 | 2+ | 5 |
| 6 | 1559 | 2+ | 5 | 10 | 1843 | 1- | 5 | 21 | 0814 | 1 | 5 | 28 | 1040 | 1- | 5 |
| 6 | 2006 | 1- | 4 | 10 | 1952 | 1 | 5 | 21 | 1057 | 2 | 5 | 28 | 1054 | 1 | 5 |
| 6 | 2015 | 2 | 5 | 10 | 2112 | 1 | 5 | 21 | 1154 | 1- | 4 | 28 | 1229 | 1+ | 5 |
| 6 | 2043 | 2 | 5 | 11 | 0810 | 2 | 5 | 21 | 1204 | 1+ | 5 | 28 | 1545 | 2 | 5 |
| 6 | 2105 | 1+ | 5 | 11 | 0937 | 2 | 5 | 21 | 1327 | 1+ | 5 | 28 | 1613 | 2 | 5 |
| 7 | 0018 | 1 | 5 | 11 | 1129 | 1+ | 5 | 21 | 1506 | 2 | 5 | 28 | 1809 | 1 | 5 |
| 7 | 1235 | 2+ | 5 | 11 | 1233 | 2 | 5 | 21 | 1613 | 1 | 5 | 28 | 1825 | 1 | 5 |
| 7 | 1515 | 1+ | 5 | 11 | 1506 | 2+ | 5 | 21 | 1807 | 1- | 5 | 28 | 1957 | 2+ | 5 |
| 7 | 1545 | 1- | 4 | 11 | 1832 | 1- | 5 | 21 | 1820 | 2+ | 5 | 28 | 2111 | 2 | 5 |
| 7 | 1601 | 1 | 4 | 11 | 1915 | 1- | 5 | 21 | 2100 | 2 | 5 | 29 | 1203 | 2+ | 5 |
| 7 | 1801 | 1 | 5 | 11 | 2103 | 1+ | 5 | 22 | 0530 | 2+ | 5 | 29 | 1329 | 1+ | 5 |
| 7 | 1823 | 1 | 5 | 12 | 0115 | 1+ | 5 | 22 | 0800 | 2 | 5 | 29 | 1536 | 1- | 5 |
| 7 | 1900 | 1 | 5 | 12 | 1637 | 1+ | 5 | 22 | 0915 | 2+ | 5 | 29 | 1600 | 1+ | 5 |
| 7 | 1931 | 1- | 5 | 12 | 1709 | 1+ | 5 | 22 | 1103 | 1+ | 5 | 29 | 1918 | 2 | 5 |
| 7 | 1959 | 1- | 5 | 12 | 1733 | 1- | 5 | 22 | 1249 | 1 | 5 | 29 | 2053 | 1+ | 5 |
| 7 | 2107 | 1 | 4 | 13 | 0350 | 2+ | 5 | 22 | 1353 | 1- | 5 | 29 | 2126 | 1 | 5 |
| 7 | 2122 | 1- | 5 | 13 | 1259 | 1 | 5 | 22 | 1417 | 1 | 5 | 30 | 1017 | 1+ | 5 |
| 7 | 2154 | 2 | 5 | 13 | 1429 | 1 | 5 | 22 | 1656 | 3 | 5 | 30 | 1230 | 1- | 4 |
| 7 | 2250 | 1+ | 5 | 13 | 1630 | 2+ | 5 | 22 | 1741 | 1 | 5 | 30 | 1238 | 2 | 5 |
| 8 | 0015 | 1- | 5 | 13 | 1754 | 1 | 5 | 22 | 2043 | 2 | 5 | 30 | 1447 | 1 | 5 |
| 8 | 0619 | 2 | 5 | 14 | 0102 | 2 | 5 | 23 | 0747 | 3+ | 4 | 30 | 1516 | 1- | 5 |
| 8 | 0802 | 1- | 5 | 14 | 0725 | 3+ | 5 | 23 | 1244 | 2 | 5 | 30 | 1551 | 1+ | 5 |
| 8 | 1440 | 1- | 5 | 14 | 1450 | 1 | 5 | 23 | 1705 | 1- | 5 | 30 | 1620 | 1+ | 5 |
| 8 | 1457 | 1 | 5 | 14 | 1703 | 2+ | 5 | 23 | 1742 | 1 | 5 | 30 | 1851 | 1+ | 5 |
| 8 | 1602 | 2+ | 5 | 14 | 1905 | 1- | 5 | 23 | 2138 | 2 | 5 | 30 | 1936 | 2+ | 5 |
| 8 | 1703 | 2+ | 5 | 14 | 1924 | 1- | 5 | 24 | 0309 | 1+ | 5 | 30 | 2100 | 1- | 5 |
| 8 | 1808 | 1 | 5 | 14 | 2056 | 1 | 5 | 24 | 1021 | 2 | 5 | 30 | 2123 | 1- | 5 |
| 8 | 1913 | 1+ | 5 | 15 | 0001 | 1 | 5 | 24 | 1539 | 1 | 5 | 30 | 2308 | 2+ | 5 |
| 8 | 2001 | 1- | 4 | 15 | 0246 | 1 | 5 | 24 | 1612 | 2+ | 5 | 31 | 0035 | 2 | 5 |
| 8 | 2022 | 1+ | 5 | 15 | 0530 | 1 | 5 | 24 | 1836 | 1 | 5 | 31 | 1027 | 2 | 5 |
| 8 | 2051 | 2 | 5 | 15 | 0556 | 1+ | 5 | 24 | 2018 | 1- | 5 | 31 | 1445 | 1 | 5 |
| 8 | 2308 | 1- | 5 | 15 | 0630 | 2+ | 5 | 24 | 2255 | 1 | 5 | 31 | 1545 | 2+ | 5 |
| 8 | 2317 | 1+ | 5 | 15 | 1027 | 2 | 5 | 25 | 1014 | 2 | 5 | 31 | 2248 | 1- | 5 |
| 9 | 0648 | 1- | 5 | 15 | 1246 | 2 | 5 | 25 | 1101 | 2 | 5 | 31 | 2354 | 1 | 5 |

SID Analysts: J. Ellerbe; S. Hansen; J. Knight; G. Miller; D. Overbeek; A. Stokes; M. Taylor; P. Taylor; A. Voorvelt; B. Wingate