

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

Peter O. Taylor, editor
237 E Hoxie Street
Spring Green, WI 53588 USA



Internet: ptaylor@ngdc.noaa.gov
74270.1516@compuserve.com
Fax: [USA] 608-231-2385

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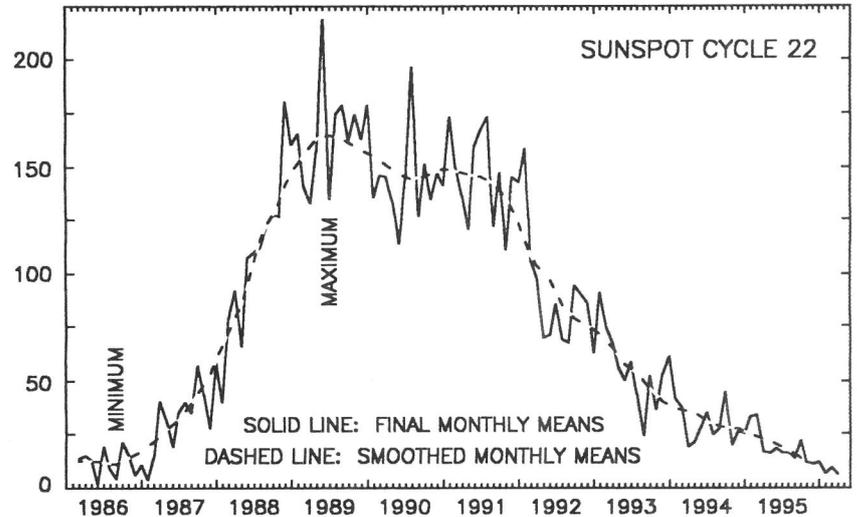
April 1996

American Relative Sunspot Numbers for April

		R _a Final			
1)	6	11)	0	21)	15
2)	11	12)	9	22)	14
3)	11	13)	6	23)	9
4)	8	14)	0	24)	5
5)	1	15)	0	25)	0
6)	0	16)	2	26)	0
7)	0	17)	11	27)	0
8)	0	18)	17	28)	5
9)	0	19)	15	29)	0
10)	0	20)	17	30)	0

Mean: 5.4

Number of reports: 91



April Summary: NOAA/USAF Region 7955, a small type-B spot-group, emerged on April 1st and skirted the solar equator during the first four days of the month as it approached the Sun's western limb and slowly dissolved. The geomagnetic field was quiet to unsettled or active during this period, and the >2 MeV electron fluence -- moderate at the end of March -- slowly declined to normal.

The Sun's visible hemisphere was spotless between the 5th and 11th. No other noteworthy activity occurred during this interval. With the exception of a few isolated instances of storm conditions primarily late on the 9th and increasing activity on the 11th, the geomagnetic field was quiet or unsettled. The daily >2 MeV electron fluence remained at normal levels.

Solar activity was limited to the off-again, on-again sunspot production in Region 7956 (N06, L261, CRO) between the 12th and 17th, when a new region emerged in the Sun's Southern Hemisphere. For the most part, the remainder of the disk was quiet. The geomagnetic field experienced storm levels on the 12th, 14th-15th and 17th-18th; the latter activity attributed to a southern polar coronal hole. The >2 MeV electron fluence was moderate and high after the 14th.

Activity was moderate on the 22nd by virtue of a single class M3.6/SF solar flare in Region 7958 (S06, L245, DAO); the first event of this X-ray intensity category to be recorded since October 1995. A significant Type II radio burst and 86 s.f.u. Tenflare accompanied the eruption. Region 7958 also produced four class C flares on the 22nd, along with several lesser intensity events. Otherwise, activity was very low between the 19th and 25th. The geomagnetic field experienced major storm conditions during the first portion of this interval, likely linked to a coronal hole stream. Isolated minor disturbances also occurred early on the 23rd. The >2 MeV electron fluence varied between high and very high until the 25th, when it declined to moderate.

The Sun was quiet during the remainder of April. Sunspot activity was limited to the emergence -- and subsequent disappearance -- on the 28th of a small type B group in the NE hemisphere. The geomagnetic field was quiet to unsettled, and the >2 MeV electron fluence declined to normal on the 28th. The smoothed mean American Relative Sunspot Number for October 1995 declined to 12.6.

The estimated mean American Sunspot Number for 1-13 May is 12. The Sun was relatively quiet until the 5th, when a series of class C flares began in Region 7962 (S05, L257, DSO), boosting the activity level into the low range. A coronal mass ejection may have occurred in conjunction with flare activity on the 5th. The geomagnetic field was in the quiet to unsettled range throughout the first thirteen days of May, and the daily >2 MeV electron fluence was normal.

[A Portion of the above information was obtained from SELDADS]

SOHO Uncovers Unexpected Solar Activity and Delves into the Mystery of Solar Plumes

Initial Observations by the recently launched **NASA/ESA Solar and Heliospheric Observatory (SOHO)** spacecraft reveal unexpected activity on the Sun and new information about the sources of the strange chaotic 'plume' structures that extend from the solar poles to high altitudes in the solar corona. Among other information, individual SOHO instruments show fine detail at the plume bases (the bases are about 1.5 times the diameter of the Earth) and measure underlying magnetic field and gas flow patterns within plume structure out to some 30 solar radii. SOHO is on location in space near the L-1 Lagrangian point where the Earth's and Sun's gravitational forces balance, about one million miles sunward from the Earth. This location allows astronomers to observe the Sun continuously, with no intervening 'night.'

SOHO was specifically designed to observe the Sun during a supposedly quiet period near the minimum of the 11-year solar cycle, when activity was thought to be low and the relatively undisturbed solar atmosphere and interior could best be studied. However, to the surprise of investigators, SOHO ultraviolet data show that there is continuous motion and action everywhere on the Sun.

Such disturbances are seen to occur even within 'coronal holes,' low density areas with low temperature and an open magnetic field structure where field lines extend far into interplanetary space rather than loop back to the Sun. SOHO's dramatic ultraviolet 'movies' also have revealed the apparent source of the long feathery plumes that extend outward from the Sun's polar regions to a distance of more than 13 million miles. The new data show the plumes standing in the solar wind, clearly revealing their bases as seething regions of wildly gyrating magnetic fields and turbulent solar gases; phenomena never before characterized. These conditions may represent the release of significant amounts of energy, thus contributing to the extraordinary heating of the corona to about 3.6 million degrees Fahrenheit. In addition, these phenomena may explain how portions of the solar wind can reach speeds of nearly 2 million miles an hour, and also shed light on the mechanism below the Sun's surface which generates the strong flows and intense magnetism that causes sunspots and solar flare eruptions.

Moreover, the new information may help astronomers determine if the plumes are a fundamental source of the high speed streams of solar wind that were sampled by ESA's Ulysses spacecraft as it passed over the Sun's poles in 1994 and 1995. The dramatic changes that occur at the feet of the polar plumes 'appear to include the breaking open of small magnetic structures to form jets that expel mass at coronal temperatures,' according to NASA's Dr Joseph Gurman (GSFC). Such features have been observed in the X-ray portion of the spectrum by the Yohkoh spacecraft, 'but this is the first time that small-scale jets have been observed outside large active regions on the Sun,' Gurman continued, 'In fact, we have now seen them within a coronal hole at the south pole, along with the plumes.'

[The above information was obtained from *NASA Release 96-87.*]

Sudden Ionospheric Disturbances (SES) Recorded During March 1996

Records were received from A9,40,50,61,62,63,68,69,70,71,72,73,74,75,76,77,78,80,81,82,83,84,85

Day	Max	Imp	Def												
11	0829	1-	5	22	0758	1-	5	22	1918	1-	5	23	1945	1	5
11	1617	1+	5												

Analysts: J. Ellerbe; S. Hansen; M. Hayden; P. King; A. Landry; G. Rosenberg; A. Stokes; M. Taylor; P. Taylor; L. Witkowski.

Frequencies recorded (kHz): 16.8; 18.3; 19.6; 20.3; 21.4; 23.4; 24.0; 24.8; 30.6; 48.5; 51.6.
