

Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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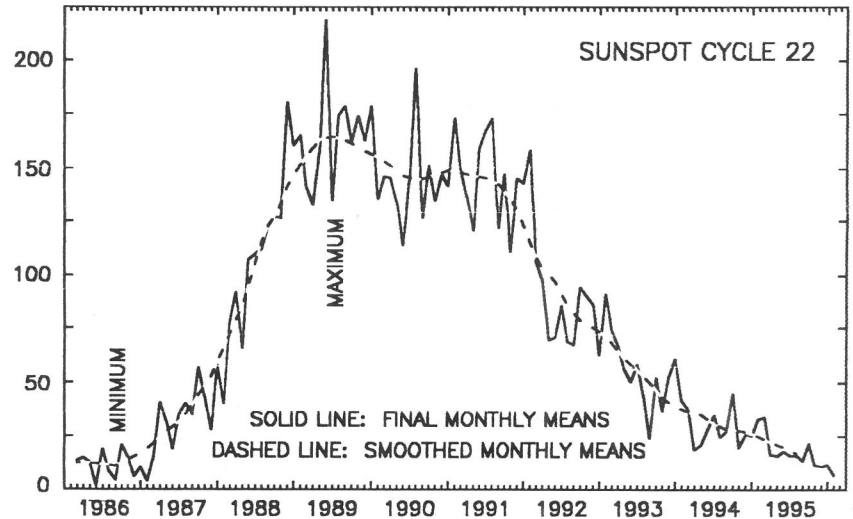
February 1996

American Relative Sunspot Numbers for February

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

Mean: 5.9

Number of reports: 92



February Summary: Last month we explained the system used by *Space Weather Operations* to classify solar activity levels. Such ratings are based on solar flare X-ray energy output during a given period (usually daily). This issue we discuss the method that is employed to determine these rankings, and outline the various classification levels. Flares are typically classed according to the order of magnitude of their peak burst intensity (I) measured at the Earth in the 0.1 to 0.8 nanometer band: Thus, a class B flare produces a peak energy of $I < 10^{-3}$ ergs per square centimeter per second; class C has a peak $10^{-3} \leq I < 10^{-2}$; a class M event $10^{-2} \leq I < 10^{-1}$; and the strongest flare - class X - peaks with $I \geq 10^{-1}$ ergs $\text{cm}^{-2} \text{s}^{-1}$. These basic step-rankings are further divided into gradations (i.e., C4.0, M1.5 etc.) that are used as multipliers for the entry-level threshold of the appropriate class.

Solar activity was very low during the first week of February. The only group to appear during this interval was a smallish type-C cluster which rotated around the Sun's western limb early on the 3rd. The geomagnetic field was quiet, and the daily >2 MeV electron fluence was in the moderately-low and normal range. Other than a series of Type III radio sweeps early on the 3rd, no noteworthy activity was recorded.

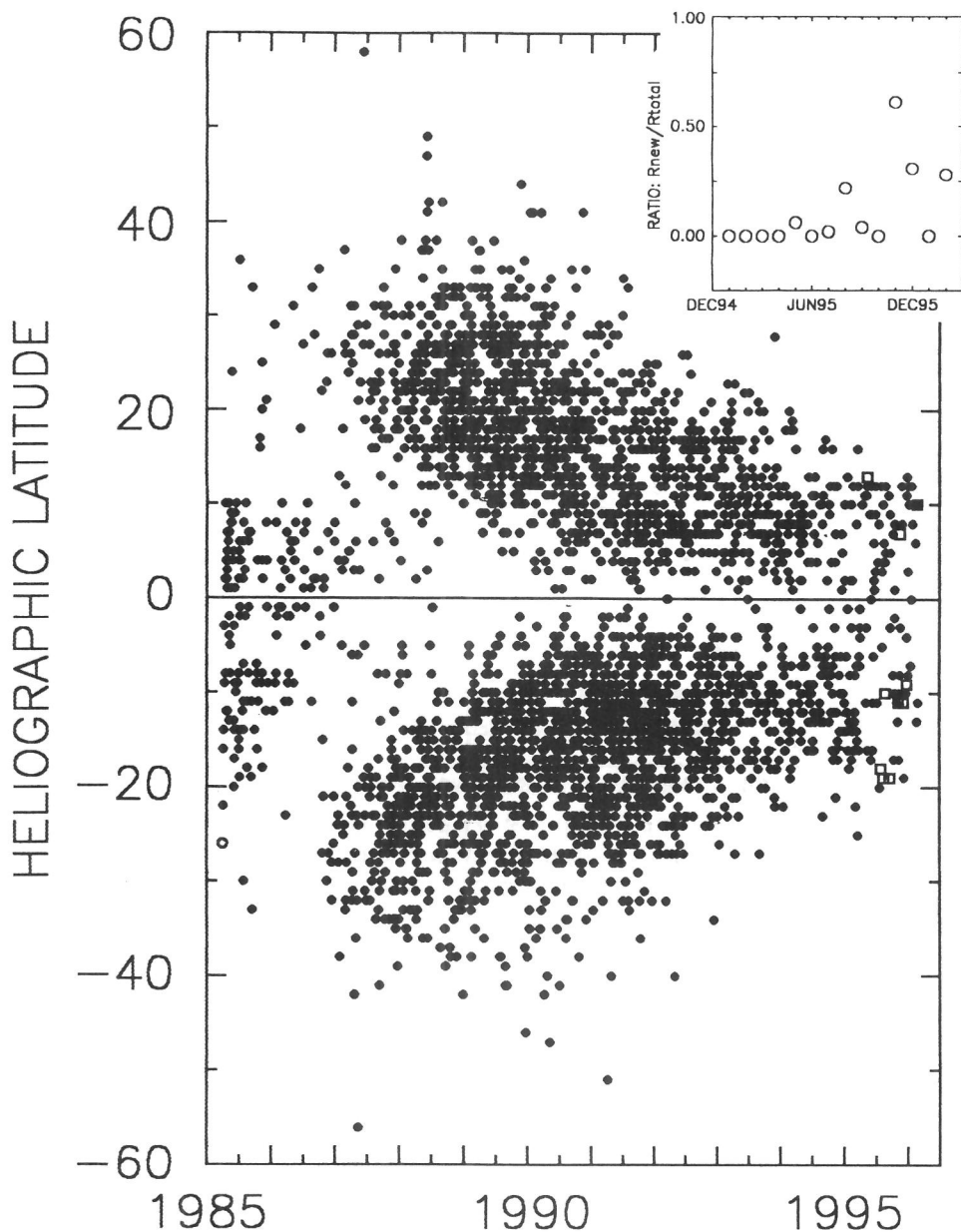
The Sun's disk was spotless throughout the second week. Consequently, activity continued at a very low level. The geomagnetic field began to experience intervals of disturbed conditions (major storm levels at high-latitudes) on the 10th. On the 13th, the >2 MeV electron fluence climbed into the high range and remained there during the rest of the period. The source of this activity is uncertain.

Activity was very low between the 15th and 22nd. Two new regions were numbered during the week; both small class B spot-groups. One of these -- short-lived NOAA/USAF Region 7947 (S13, L290) -- was the first spotted area to appear in the Sun's Southern Hemisphere during February. The geomagnetic field was quiet to unsettled, and the >2 MeV electron fluence declined to the normal or low-moderate range on the 16th.

The final week of February saw a continuation of the current long series of very low daily solar activity levels. Region 7948 (N10, L235) emerged on the 24th, rapidly matured into a type-D sunspot group, then dissolved. Region 7948 is a reverse-polarity cluster (when compared with Cycle 22), and therefore may be associated with new solar Cycle 23. Other than a 13-degree filament which faded early on the 24th, and the arrival on the 28th of Region 7949 (S12, L149, BXO), only the second spot-group to appear in the Sun's Southern Hemisphere during the month, little noteworthy activity occurred during the remainder of February. The geomagnetic field experienced a short interval of storm conditions on the 24th, but otherwise was quiet to unsettled. The daily >2 MeV electron fluence became moderate on the 25th, then declined a bit towards the end of the month. The smoothed mean American Relative Sunspot Number for August 1995 is 16.1. The estimated mean for 1-10 March is 1.

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

Updating the Cycle 22 Butterfly-Diagram and Rnew/Rtotal Ratio



In the October 1995 issue of the *Solar Bulletin* we introduced the concept of the ratio, R_{new}/R_{total} , and outlined its use in tracking the arrival of the new solar cycle. The diagram to the left shows our latest version of the Maunder Butterfly-diagram for cycle 22 through February 1996, and the inset graphic depicts the monthly ratios from January 1995 through February 1996.

The first spot of the current cycle is indicated by the open circle symbol to the extreme left, while open square symbols to the right represent possible Cycle 23 sunspot groups -- i.e., those clusters with magnetic polarity that is opposite to that considered normal for the current cycle, and which have emerged beginning May 1995.

These latter determinations, and the monthly ratio computations (see the October 1995 issue), are provided by Dr. Richard Thompson and Dr. John Kennewell (respectively, *Australia's IPS Radio & Space Services* and the *Learmonth Observatory*).

-- the editor --

Sudden Ionospheric Disturbances (SES) Recorded During January 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	Day	Max	Imp	Def	Day	Max	Imp	Def	Day	Max	Imp	D
3	1335	1-	5	3	1707	1-	5	4	1007	1-	5	4	1625	1	5
3	1409	1-	5	3	1757	1-	5	4	1111	1	5	4	1827	2	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.