

SOLAR DIVISION Bulletin

MAY 10 1955

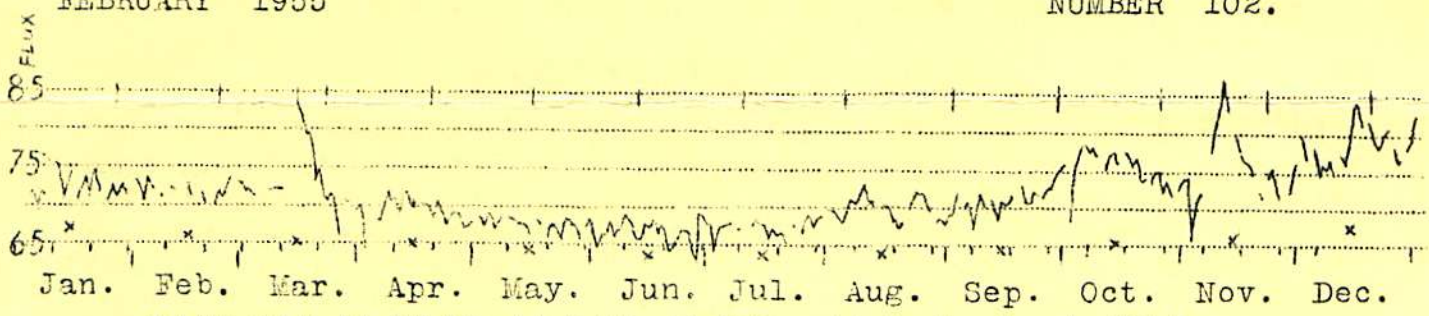
Harry L. Bondy, Editor

43-58 Smart St., Flushing 55, N.Y.

Editorial Advisory Committee: Neal J. Heines - Margaret W. Mayall - William A. Reid
David W. Rosebrugh - Alan H. Shapley (CRPL)

FEBRUARY 1955

NUMBER 102.



DAILY VALUES OF SOLAR FLUX AT 2800 Mc/s (10.7cm) 1954.

RECORDED AT THE NATIONAL RESEARCH COUNCIL
OTTAWA, CANADA

(x illustrates monthly variation of apparent solar diameter)

The above graph of solar-radio-noise shows clearly that there is still some residual "solar activity" on spotless days. The increased flux due to associated spot activity is superimposed on the thermal radiation of the "quiet sun". Compare this graph with that of sunspot activity (RA') published in the January "Solar Division BULLETIN". p.5.

The MINIMUM IN SOLAR FLUX at 2800 Mc/s (10.7cm) was computed in the same manner as that for sunspot numbers, namely by means of what one might call "smoothed-monthly-flux-averages". The 10.7cm flux minimum thus occurred in April 1954 with a minimum value of 71.0. (This flux is expressed in units "watts/m²/cycles/second bandwidth ($\times 10^{-22}$) - 2 polarizations")

The MINIMUM IN CORONAL ACTIVITY. According to High Altitude Observatory's "monthly mean coronal daily sums 5303 Å (green line) intensity ≥ 5 Climax east limb data only" (Report No.HAO-23 and extended till Nov.'54) the minimum in coronal activity occurred sometime between December 1953 and September 1954 or mid-minimum during April-May 1954.

Thus sunspots, solar-noise and coronal activity all reached minimum at the same time at 1954.3.

According to High Altitude Observatory the present minimum was much broader than that of 1944 and "also descended to a much lower level of disturbance".

* * * * *

NOTES for the S U N S P O T O B S E R V E R .

We are happy to announce that thanks to the U.S. NAVAL OBSERVATORY, whose "Preliminary Measures of the Sun" we now receive, we are able to bring to our observers pertinent data on sunspots and their classification each month. We are very grateful to the U. S. Naval Observatory and hope that this information will permit sunspot observers to check their own observations more closely.

- - - - -

During JANUARY 1955 the sun was photographed on 25 days at the U. S. Naval Observatory. Almost one third of all daily recorded sunspot groups were unipolar H-type groups; the rest were almost evenly distributed between the types A-B-C-D. 24 daily counted groups occurred in the Northern hemisphere, 18 in the Southern. About half of these spots appeared in latitudes $\pm 20^\circ$ to 24° ; highest lat. was 38° ; lowest 17° .

Data on date of maximum spottedness ($R_A' = 57$).

On January 7th four sunspot groups were recorded.

- I. The easternmost group (73° East of central meridian= -73°) was the largest. (Its maximum area of over 1100 millionths of the sol. hemisphere occurred on Jan. 8.) This was a unipolar H-type group in lat. 37° N. This group appeared already in mid-December, developing near the central meridian. During January it was associated with highest coronal activity (the yellow cor. line was recorded both East and West on Jan. 6. and 19!); several flares (Jan. 7, 10, 16), major radio-noise bursts, a geomagnetic storm (Sudden Commencement=S.C.) and a strong aurora on January 17.
- II. In the central zone (from -17° to -6° ; lat. 21° N) was a bipolar E-type group, with a large P-spot (=Preceding). This too was a very active group associated with flares Jan. 5, 6), a Sudden Ionospheric Disturbance (=S.I.D.) Jan. 6; and radio-noise bursts. The region's coronal activity was only moderate. Max. area 922 millionths of sol. hem. Jan. 7.
- III. A small bipolar B-type group (the larger P-spot was at $+6^\circ$ (=West of central meridian) and 36° S.
- IV. A small unipolar A-type group was at $+28^\circ$ and 25° South.

A small sunspot group: On January 15th there was besides the large H group ($+29^\circ$; 37° N) a small A-type group at -65° (East) and 36° N. Its area was only about 12 millionths of sol. hem. ($1/4^\circ$). Did you see it?

P.S. Your comments and suggestions on this column will be appreciated. Your drawings or photographs are highly welcome. Our next issue will carry a chart and definitions of sunspot group classification. hlb

* * * * *

 * SPECIAL ANNOUNCEMENT *

The February 1955 issue of SCIENTIFIC AMERICAN carries an excellent article on CORPUSCLES FROM THE SUN by Dr. Walter Orr Roberts. It describes "The connection between these solar particles and terrestrial effects.." Dr. Roberts presents a lucid picture of the solar-terrestrial relationship and describes his new hypothesis on corpuscular radiation.

Thanks to Mr. Donald H. Miller, Jr., General Manager, SCIENTIFIC AMERICAN, we are able to mail to all our active observers a reprint of this fine paper. We are greatly indebted to the SCIENTIFIC AMERICAN for this opportunity.

L E T T E R S :

"In the January issue of the BULLETIN I found one thing that should be corrected so as not to cause confusion. You should say that "one half the sum of these two averages is the smoothed number for the middle month of the 13 months used". Most of your readers probably understood you to mean "sum" here, but some might not understand this procedure because of this point".

"On page 4 you say that the solar constant is 1.97 cal/cm²min. I would like to call your attention to an article by Francis S. Johnson, of the U. S. Naval Research Laboratory, in the December 1954 issue of the JOURNAL OF METEOROLOGY (11. 431). In this article he describes how he recomputed the solar constant. I will quote the article's abstract:

The value of the solar constant indicated by 30 years of observation by the Smithsonian Institution is revised in the light of the scale correction announced in 1952 and new spectral-irradiance data for outside the earth's atmosphere obtained by the Naval Research Laboratory. The ultraviolet and infrared corrections applied by the Smithsonian Institution in solar-constant determinations are examined and re-evaluated. The accuracy of their measurement of total irradiance in the spectral range 0.346 to 2.4 microns is in general supported, only a 0.3 per cent increase being indicated owing to the revision of a correction applied in reaching this value. The corrections for radiation outside this spectral range are found to be larger than those used by the Smithsonian Institution. The new value of the solar constant is 2.00 calories per square centimeter per minute, with a probable error of two percent, and the solar-illuminance constant is 13.67 lumens per square centimeter (10,700 foot-candles).

..... Sincerely,

LEITH HOLLOWAY

7602 Rugby Street, Philadelphia 19, Pa

Ed. note: Mr. Holloway's comment on the "smoothed-number" definition is proper being more precise. I am grateful for this correction as well as for the information on the solar constant. HLB

* * * * *

Mr. B. C. PARMENTER (Northwestern Observatory) kindly send me a copy of an interesting letter mailed to Dr. Walter Orr Roberts (HAO):

"At 1835 U.T. 1 February, 1955 the quite large spot in the South MC zone was observed to have an orange colored area at a point E/SE where umbra and penumbra met. This observation was made at 60x with the 8" G.R.T.L. 'field instrument' of which you know the optical properties, giving the pure-white solar disk and showing the usual pure-black spottedness."

"As the sky was completely overcast except for a small opening sunward, it was only minutes before the lightened edge of a cloud mass encroached upon the sun. As this mass moved progressively over the disk the colored area was seen to dwindle; starting from its periphery and gradually working inward as the cloud-filtering became denser, until there was nothing but an enhanced 'color-core' left.

continued on page 4.

American Relative Sunspot Numbers- R_A - for January 1955

Day	R_A	Day	R_A	Day	R_A
1	21	11	32	21	8
2	16	12	31	22	9
3	16	13	28	23	22
4	29	14	17	24	22
5	37	15	16	25	15
6	53	16	17	26	25
7	57	17	14	27	26
8	47	18	11	28	16
9	38	19	10	29	13
10	28	20	4	30	21
				31	22

Mean daily R_A ' = 23.3

* * * * *

Zürich Provisional Sunspot Numbers- R_Z -
for December* 1954 and January 1955. Dependent on observations
at Zürich Observatory and its stations in Locarno and Arosa.

Day	RZ		Day	RZ		Day	RZ	
	Dec.	Jan.		Dec.	Jan.		Dec.	Jan.
1	0	22	11	0	33	21	14	8
2	0	17	12	0	31	22	7	8
3	0	11	13	0	28	23	7	8
4	0	19	14	0	27	24	15	19
5	0	32	15	11	18	25	10	21
6	0	22	16	18	16	26	7	25
7	0	23	17	17	15	27	0	25
8	0	29	18	14	10	28	0	19
9	0	31	19	19	9	29	13	16
10	0	36	20	19	7	30	29	12
						31	25	22

Mean daily R_Z for December = 7.3

Mean daily R_Z for January = 20.0

* Ed.note: Due to lack of space we were unable to include the
December Zürich Sunspot Numbers in our BULLETIN

* * * * *

LETTERS (continued from page 3)

(Mr. E. C. Parmenter's letter):

"This core was quite considerably brightened and gave the apparent effect of a flare spurting upwards from the umbral vortice-lip. Furthermore, as the cloud density grew lighter for an instant, the effect was seen to reverse its action, when it at once became more cloudy and the spot was left in a normal black state. Though I observed for a few minutes longer, the cloud density did not lessen greatly enough for the observation to be repeated."

Ed.note: The spot region where Mr. Parmenter observed coloring showed 2 flares on Jan. 30th, however no flares were recorded at Sacramento Peak on Feb. 1, though flare-patrol cameras were in operation all day. The reality of coloring in spots is no longer in doubt, though its cause is still unknown.