NEW ULTRAVIOLET SOLAR FLUX MEASUREMENTS AT 2000 Å USING A BALLOON BORNE INSTRUMENT

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A grating monochromator has been flown from Aire sur l'Adour (Landes) on May 10, 1968, April 19, 1969 and October 3, 1969. The instrumentation and the experimental procedure have been described previously (Ackerman *et al.*, 1968) as well as the results of the first flight. For the two subsequent flights the wavelength marking was improved by increasing the number of the telemetered wavelength marking pulses. For the last flight the FM-FM analog telemetry system was replaced by a PCM telemetry system in such a way that the data analysis was completely made by means of a computer. Float altitudes were respectively 34, 38 and 37 km. From 1850 Å to 3000 Å up to 90 spectra per flight of the solar radiation penetrating into the atmosphere were telemetered to the ground. The solar zenith distance was ranging from 30° to 60°. The equivalent slit width was equal to 19 Å in the case of the first experiment and was equal to 14.6 Å for the two subsequent flights.

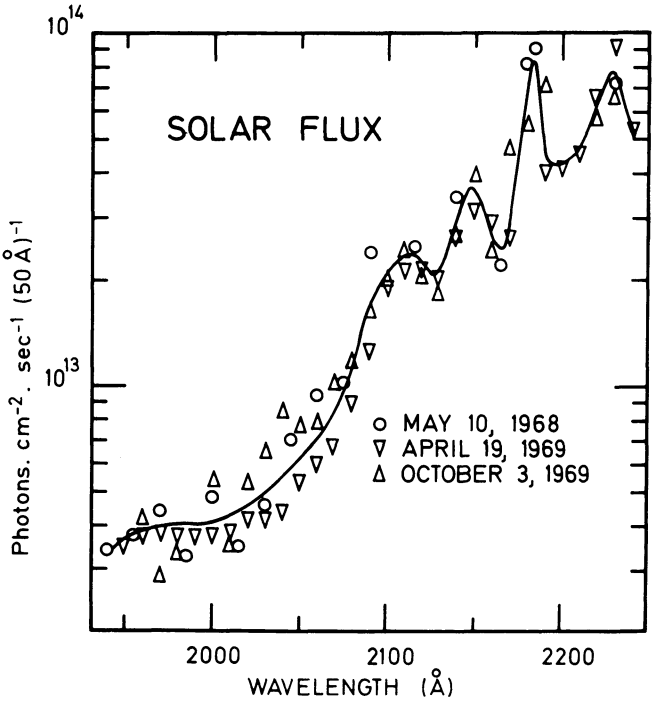

Fig. 1. Solar flux at one AU. versus wavelength. A curve has been fitted at best to the experimental data of three balloon flights.

Labuhn and Lüst (eds.), New Techniques in Space Astronomy, 251–253.

Calibration of the instrument on the International Pyrheliometric Scale 1956 was performed before and after each flight by using a sodium salycilate coated photomultiplier and a Reeber thermopile.

By extrapolation to zero air mass, solar fluxes in the absence of atmospheric attenuation have been deduced from the change of the measured fluxes with the solar zenith distance. The results are presented in Figure 1. A curve has been fitted at best to the data points and has been reproduced in Figure 2 where our measurements can be compared with other results. Solar fluxes for various black body temperatures of the sun are also shown. The sharpness of the 2085 Å discontinuity indicated by Bonnet (1968) is confirmed. The values given by Detwiler *et al.* (1961) are slightly

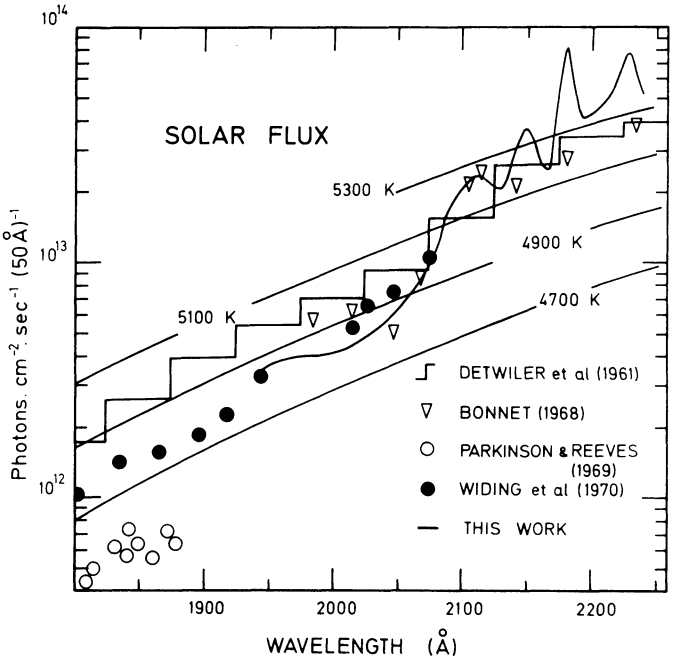

Fig. 2. Values of the solar flux at one AU. versus wavelength obtained by various authors. Fluxes for several solar black body temperatures in °K are also shown.

lower above 2150 Å and higher, below 2050 Å than those reported here. These agree reasonably well with the values published by Widing *et al.* (1970) which are higher by about a factor of two at 1850 Å than the values given by Parkinson and Reeves (1969).

This actual situation shows the need of new experiments.

References

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DISCUSSION

R. Muri: What kind of photomultiplier did you have used for measurements at 2000 Å? What was the accuracy of measurements?

M. Ackerman: It is an EMI 6255 photomultiplier with a cadmium cathode. The accuracy of the measurements is $\pm 15\%$.

W. H. Parkinson: Reeves and I have reflown our instrument in September 69. Although we have not yet checked the 1800 Å region, the 1650 Å region showed the same intensity as our earlier flight at about 4300° brightness temperature in continuum with absorption bands of CO even lower.

M. Ackerman: What is needed in aeronomy is the total flux coming from the whole sun and it would be very useful if you were also interpreting your data in this direction.

https://doi.org/10.1017/S0074180900103602 Published online by Cambridge University Press