The circumpolar long-period variable S UMi, period 324 days, has been observed with the Curtis Schmidt from 17 March 1955 to 17 January 1956. Nineteen spectra on I-Z(2) emulsion were obtained on 10 nights; 17 on I-N plates, usually on the same nights. Occasional direct plates provided a check on the phase of the light curve.

As already indicated by scattered spectrograms of a number of stars, the $\lambda 10500$ band appears rather abruptly at about class M6, and rapidly becomes more conspicuous with advancing spectral type. In S UMi, it is rather inconspicuous at maximum, type about M6, while at minimum, the spectral class being between M8 and M9, it dominates the spectrum over a range of some 300Å.

The increasing absorption of this feature is correlated, in S UMi, with the absorption by VO near $\lambda 7900$; and with a general depression of the spectrum between $\lambda 8600$ – 8800 as compared with that between $\lambda 8200$ – 8400 .

Kuiper, G. P., Wilson, W., and Cashman, R. J. 1947, *Ap. J.* **106**, 243.

Miller, Freeman D. 1953, *Ap. J.* **118**, 572.

McKellar, Andrew. 1955, *J. R. A. S. Canada* **49**, 73.

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Ann Arbor, Mich.*

Miller, William A. A study of solar granulation.

In view of the report of Macris and Elias (1955) that a relationship exists between the number of granules and the sunspot number, it was felt that the following work should be undertaken.

A study of the photographs taken with the 6-inch $f/80$ telescope of the RCA Laboratories, Rocky Point, N. Y. was made. Fifty-six plates proved suitable for this study. By limiting the maximum number of plates per month to three it was possible to keep in hand the amount of labor involved. Only 4 of the 38 months from Sept. 1952 to Oct. 1955 are not represented in the data.

The granule diameters were measured visually using a microscope with an eyepiece micrometer. Two observers each measured the diameters of over 500 granule images on each plate, and used different magnification. The mean of the two observations was called the mean granule diameter for the date, $\bar{\theta}$.

When $\bar{\theta}$ was plotted as a function of the date on which the various plates were taken, there was no indication of any change which can be

attributed to the phase of the solar cycle. However, when $\bar{\theta}$ was plotted as a function of the Zurich provisional daily sunspot number, R_z , the linear correlation coefficient was -0.23 , significant at the 5 per cent level.

Using a counting reticule the same two observers independently counted the number of granules, noting at least 1000 on each plate. From these data the value of N_{gr} , the number of granules on the whole sun, was calculated. The linear correlation coefficient between N_{gr} and R_z was found to be $+0.51$ significant at less than the 1 per cent level.

The method of least squares was used to determine the straight lines fitting the data for the two cases with the following results:

$$\begin{aligned}\bar{\theta} &= 1.91 - 0.00062 R_z \\ 10^{-6} N_{gr} &= 1.706 + 0.0031 R_z.\end{aligned}$$

Since most of the data were taken during the recent solar low it is felt that the investigation should be continued through the oncoming solar high in order to further test these conclusions. This work was supported by U. S. Army Signal Corps Contract Da-36-039-sc-64524.

Macris, C. and Elias, D. 1955, *Ann. Astroph.* **18**, 143.

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Rocky Point, N. Y.*

Mitchell, Walter E., Jr. A spectrophotometric study of the combination variable Z Andromedae.

Spectrophotometric observations of July–September 1952 refer the composite spectrum of Z Andromedae to comparison stars in the visual, red, and near infrared, to provide a basis for distinguishing brightness fluctuations of the early and late-type components.

On spectrograms covering the interval Jan. 52 to Feb. 53, the ratios ($FeII/HeI$) and ($HeII/HeI$) indicate a rise in the general level of excitation in mid-1952, followed by a decline.

Observations made with the 60-inch Mt. Wilson reflector in October 1955 show a continued high level of excitation, including lines of [NeV] and possibly [$FeVI$] and [$FeVII$]. The Balmer series to H_{21} shows radial velocities increasingly more negative with quantum number, averaging -55 km/sec, and He singlets and triplets show a systematic difference of 8 km/sec.

A schematic model illustrates that the effective target area of the B star to the M star may produce, in the P Cygni stage, the observed low