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A NEW LIGHT CURVE OF CG Cyg

The unusual eclipsing binary CG Cyg has a distortion wave, which seems to be advancing through the light curve at an increasing rate. Because significant variations in the light curve occur over a period of months (Zeilik 1982), a new light curve was obtained by combining data from four of five consecutive nights.

These observations were made from the Climenhaga Observatory of the University of Victoria on 17-18, 18-19, 20-21, and 21-22 August 1982. A 50 cm reflector and photometric system closely matching the V and B filters of the Johnson system was used. Unfortunately due to equipment problems the sky brightness in the V band was not adequately subtracted, rendering the V data useful only for colour transformations. The observations of the variable star were bracketed by observations of the comparison star BD+34°4216, whose constant brightness was checked at least nightly with observations of BD+34°4213. The difference in B magnitude was  $1.57 \pm 0.02$  indicating that the comparison star has remained constant since 1965 (Milone et al 1979). Mean extinction and transformation coefficients were used to correct the differential magnitudes to the Johnson system.

The differential B magnitudes are plotted in the figure against heliocentric phase calculated from the ephemeris of Milone and Zeibarth (1974). The phases of minimum light were  $0^{\text{P}}.0174 \pm 0.0011$  and  $0^{\text{P}}.5168 \pm 0.0019$  as found from all the data points within  $0^{\text{P}}.03$  of the minimum using a computer program based on the method of Kwee and Van

## CG CYG

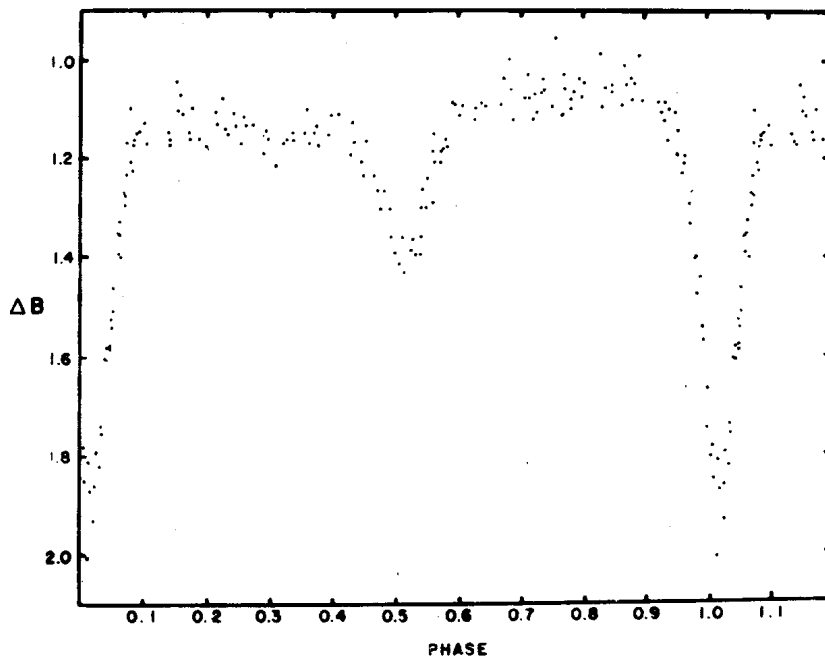


Figure 1

Worden (1956). A truncated five-term Fourier series was fit to the intensity data excluding the points within  $\pm 0.08$  of the observed minima. The constant term  $A_0$  is  $0.3600 \pm 0.0016$  which indicates that CG Cyg is dimmer now than in 1977 and 1982. The cosine terms normalized by  $A_0$  are  $A_1 = +0.0113 \pm 0.0061$  and  $A_2 = -0.0128 \pm 0.0067$  and the normalized sine terms are  $B_1 = -0.0407 \pm 0.0040$  and  $B_2 = +0.0022 \pm 0.0044$ . Following the definitions of Milone et al. (1979), the phase of the distortion wave is calculated to be  $286 \pm 8$  degrees and the amplitude is  $0.0422 \pm 0.0041$ .

In comparison with the past behaviour of this system, as reported by Milone et al. (1979), Zeilik et al. (1982), and Jassur (1978), the light curve seems most similar to that of 1965; so similar that the corresponding coefficients of the Fourier series of the two years are

nearly within the errors of one another. Since the system experienced a change of period between 1965 and 1967, further observations may be rewarding.

The value of this light curve lies in the fact that it is unlikely that significant variations occurred during the five nights of observations. Phases of overlap, 0.05 to 0.08 and 0.54 to 0.57, were examined for significant differences and none were found. The amplitude and timescale of short term variations might be determined by comparing this light curve with others observed at nearly the same epoch. To assist other observers in making this comparison, the data have been deposited in the I.A.U. Archives of Unpublished Observations of Variable Stars, File No. 135 (Breger 1981).

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