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W CRU - MINIMUM IN THE GENEVA PHOTOMETRIC SYSTEM

W Cru = HD 105998 is an enigmatic eclipsing variable. Plavec (1984) launched the campaign for observation of this star and the reader can find further information in his paper. Here we publish some of our preliminary observational results to provide a guidance to spectroscopists about the most important phases. So far we have no data about the secondary minimum, but observations continue.

The observations are performed with the reflecting 70-cm Swiss telescope at ESO La Silla and the P7 photometer (Burnet 1976, Burnet, Rufener 1979) for the GENEVA photometric system (Golay 1974, 1980, Rufener 1964, 1981). Figs. 1 to 3 represent part of the light curve close to primary minimum in colours [V], [U] and [G] respectively. For phase calculation the following ephemeris was used:

$$\text{Min I (HJD)} = 2440731.6 + (198.53)^d \cdot E$$

The asymmetry of the light curve with respect to the minimum is obvious. It would be important to know whether this asymmetry repeats for all eclipses or if it varies from one eclipse to another. Also the difference in the photometric behaviour for different colours is quite apparent. The humps on both sides of the minimum are puzzling. Fig. 4. shows the variation of the Geneva index [U-B2]. There is lot of symmetry and also asymmetry in this behaviour. Using this graph theoreticians and spectroscopists may select the appropriate phase for more detailed study to find out what is really happening at certain phases. The star is quite bright (8 mag.) and the period long (198.5 day) and high resolution spectra can be obtained even with telescopes of moderate size.

Fig. 5 shows the relationship between magnitude [V] and the index [U-B2]. Each measured point is represented by two digits showing the phase multiplied by 100. Thus the number 08 marks (at its center) the point with phase 0.08. The asymmetry between the descending and ascending branches is remarkable. Note the differences close to the phases .13 and .83, and also the loop between phases .17 and .28. If this loop also repeats at other cycles (epochs) at the same phase, this part of the light curve might be the most interesting one for spectroscopic observations. However, comparing our light curve with the recent photoelectric observations of other observers (Marino et al. 1984, Menzies, Jones 1984) we see that the light curve might be variable and the steps and humps may not always occur at the same phase. Nevertheless, from our data it also seems that other indices are changing continuously and smoothly between the phases .15 and .30, and would deserve further attention of both photometrists and spectroscopists.

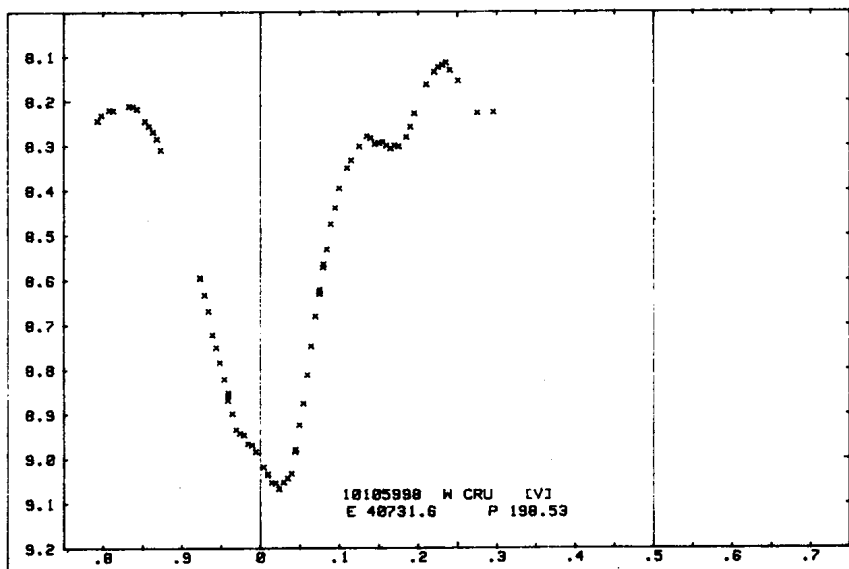


Fig. 1. Magnitude [V] against phase for W Cru

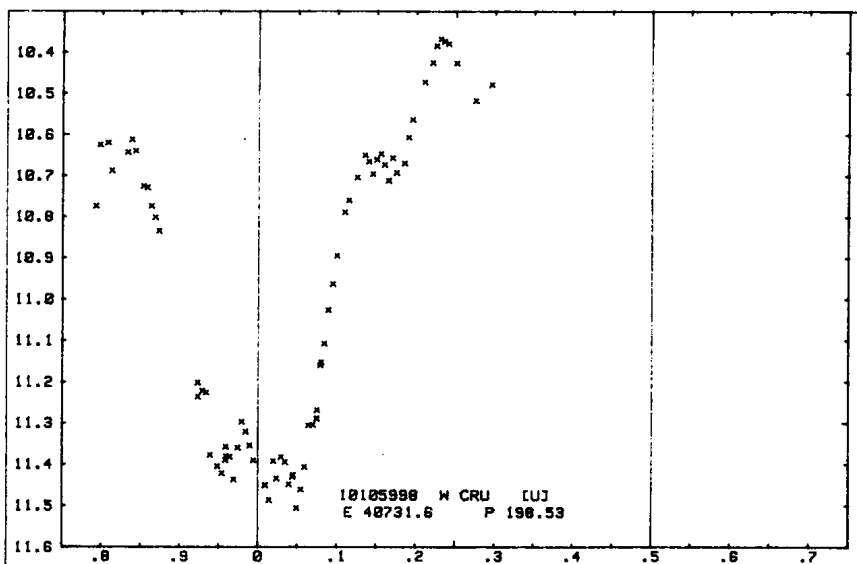


Fig. 2. Magnitude [U] against phase for W Cru

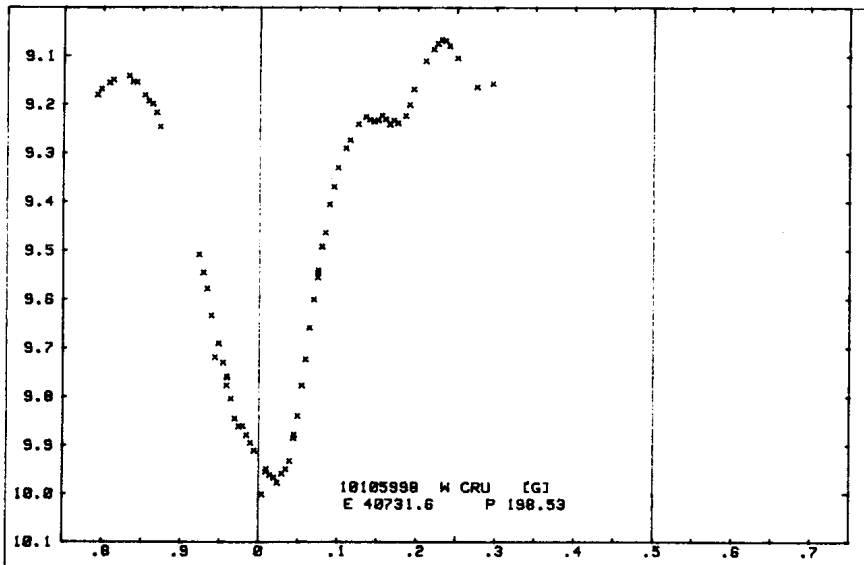


Fig. 3. Magnitude [G] against phase for W Cru

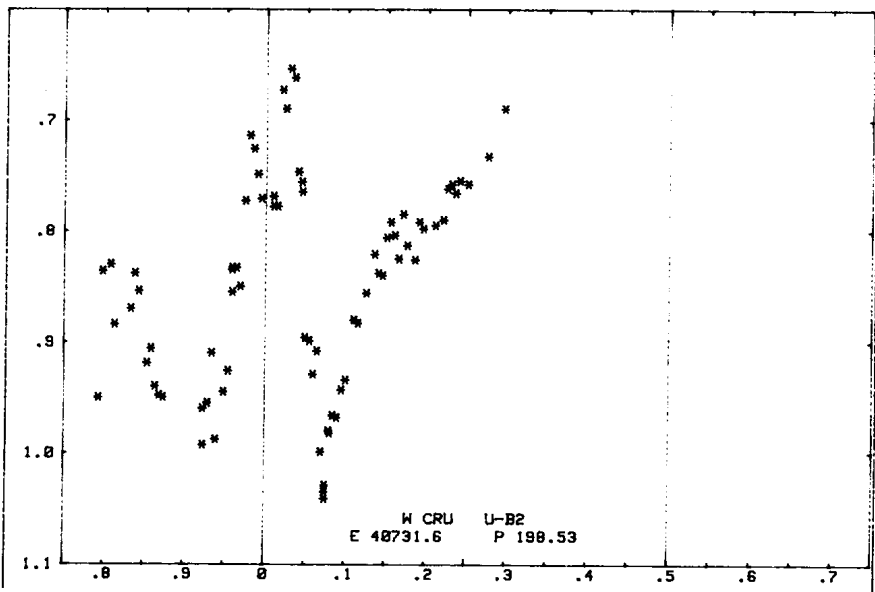


Fig. 4. Geneva index [U-B2] against phase for W Cru

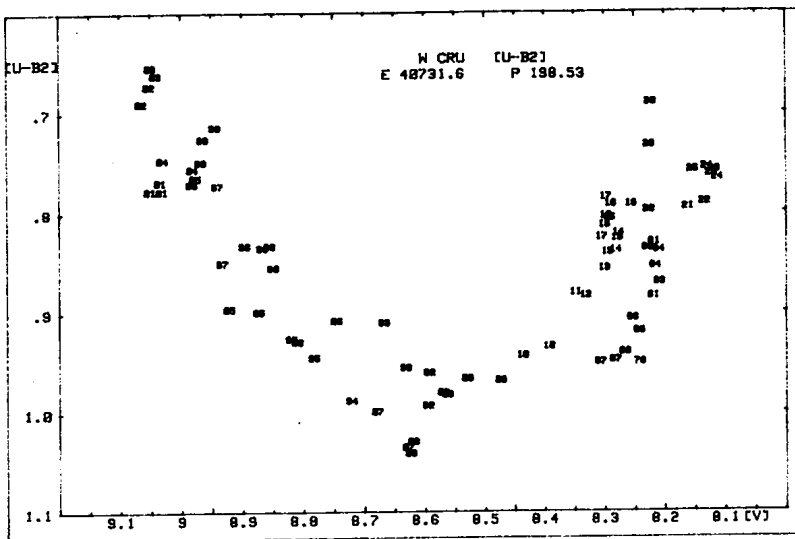


Fig. 5. Colour index [U-B2] against magnitude [V], two-digit numbers represent the phase multiplied by 100

Most of the observations were done in 1984/85 by one of the authors (Z.K.). Since then some observations have been carried out by the constructor of the photometer, M. Burnet, and occasionally by other observers of the Geneva Observatory. Further observations are being reduced and they will be published elsewhere.

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