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PHOTOELECTRIC OBSERVATIONS OF THE PECULIAR SYSTEM VW Cep

VW Cep (= BD +75^o752 (7.2) = HD 197433 (G5) = GC 28804) is a W UMa-type system. Since its discovery (Schilt, 1926) it has been frequently observed because of its peculiar light variations. The orbital light-time effect proves the existence of a third star in the system (Hershey, 1975).

Mauder (1972), Rucinski (1973, 1974) and Giannone and Giannuzzi (1974) made several studies explaining the physical properties of the VW Cep system.

Schmidt and Schrick (1955) gave the following ephemeris:

$$\text{Min I} = \text{J.D. } 2424658.759 + 0.^{\text{d}}.27831993 \text{ . E.}$$

Brown and Pinnington (1969) studied VW Cep as a typical system of the W UMa-type variables. Szczepanowska (1959) made photoelectric observations of this star. She found that the variations of the O-C values were identical for the primary and secondary minima, and the course of the O-C diagram suggested a periodicity in the period variation.

Szafraniec (1960) constructed a number of light curves for 3 eclipsing binaries, among them was the VW Cep system. Todoran and Pop (1972) investigated several minima of this star and found the following periodic elements:

$$\text{Min I} = \text{HJD } 2433483.4257 + 0.^{\text{d}}.27831758 \text{ . E} + 0.^{\text{d}}.050 \cos [0.^{\text{d}}.0048 (\text{E}-4700)]$$

Rovithis and Rovithis-Livaniou (1980) show that the period decrease which started in 1960 is still present. Hershey (1975) discussed the period changes, determined the absolute parallax and the astrometric orbit of VW Cep and proved the presence of a third body in the system.

Kreiner and Winiarski (1981) presented photoelectric observations of this star in three successive nights and reported short time-scale variations in the light curve. Mahdy and Soliman (1982) observed new light curves of VW Cep using the ephemeris of Cristescu (1978):

$$\text{Min I} = \text{J.D. } 2443448.2663 + 0.^{\text{d}}.2783176 \text{ . E.}$$

These elements are also used in the present work. Mahdy and Soliman concluded that outside the eclipse, the VW Cep system is somewhat brighter, when the larger and hotter component is advancing while the smaller and cooler component is receding, than in the case of converse position.

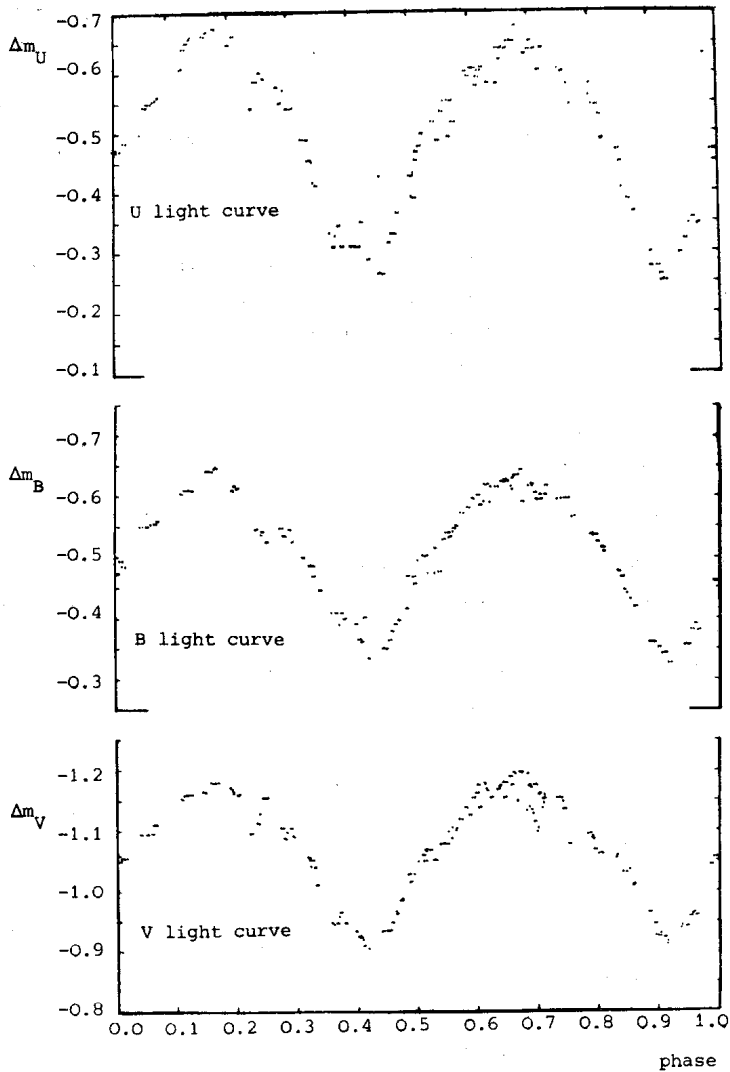


Figure 1

The observations of the present work were carried out at Kottamia Observatory using the 74" reflector on two successive clear nights, 7/8 and 8/9 of July, 1982. The instruments were described in Mahdy and Soliman's (1982) paper. BD +75°877 was used as comparison star.

The light curves in three colours are seen in Figure 1. Four primary and four secondary eclipses were observed. The observations will be published in Helwan Observatory Bulletin.

The observed light curves are somewhat scattered and this is similar to that observed by Mahdy and Soliman (1982). In order to describe the variability of the VW Cep system more observations are needed. Further photometric observations of this system are planned.

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