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**PHOTOMETRIC OBSERVATIONS OF VW CEPHEI IN 1996**

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VW Cephei (HD 197433) is a W-type W UMa-type eclipsing binary with an orbital period of  $P = 0^d.2683$ . It consists of chromospherically-active components of spectral types of G5V + G8V. The light curve of VW Cep is frequently asymmetric, and these asymmetries may be the result of large starspots covering significant fractions of the stars' surfaces (Guinan & Giménez, 1993). Because of its brightness, short period, and changing period and light curve, VW Cep is a favorite variable star for photometric studies. According to Vinkó *et al.* (1993), VW Cep has been the most frequently studied object appearing in the *IBVS* over the last 35 yrs.

Photoelectric photometry of VW Cephei was obtained during 9 nights from late September to early November 1996 at the Villanova University Observatory. The observations were carried out with the 38-cm Cassegrain reflector equipped with a photoelectric photometer using a refrigerated EMI 9658 photocell. HD 197665 (F2;  $m_v = +7.6$  mag), served as the chief comparison star. A Strömngren *y* (550nm) filter and an intermediate band *r* (660nm) filter were used. These filters have bandpasses of full width half maximum of 26 nm and 28 nm, respectively. Nearly 600 observations were recorded in each band-pass. The integration time for each observation was 20 seconds, and the observation sequence was the usual sky-comparison-variable-comparison-sky routine. The data were corrected for atmospheric extinction, and the observed times were converted to heliocentric Julian dates. Figure 1 shows the resulting light curves for VW Cep, in which the phases were computed using the light elements of Lloyd *et al.* (1992):

$$MinI = HJD\ 2446822.5233 + 0^d.2783099 \times E \quad (1)$$

Table 1 lists the values of the delta magnitudes (in the sense *variable minus comparison star*) of the light curve extrema.

Table 1

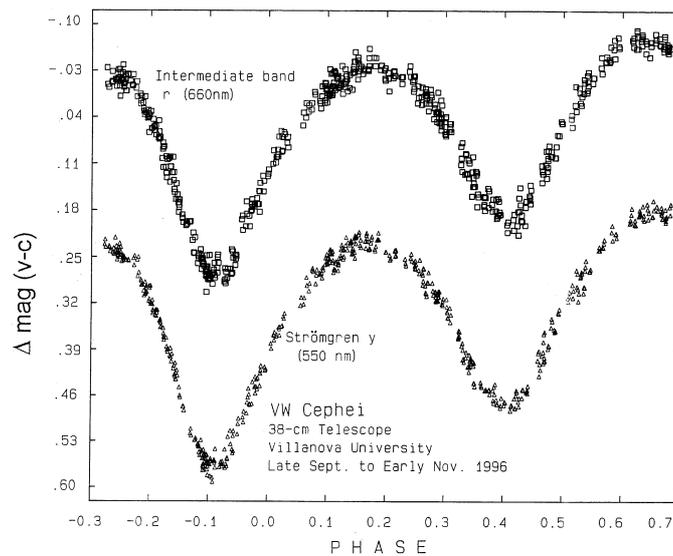
	$\Delta m(v - c)$ for intermediate band <i>r</i> (660 nm)	$\Delta m(v - c)$ for Strömngren <i>y</i> (550 nm)
Primary Minimum	+0.272	+0.564
Maximum I	-0.042	+0.227
Secondary Minimum	+0.191	+0.475
Maximum II	-0.076	+0.181

Both Figure 1 and Table 1 show that there are asymmetries in the light curves in which the maximum following primary eclipse is fainter than the corresponding maximum that follows secondary eclipse (Max II) by 0.034 mag in  $r$  and 0.046 mag in  $y$ . It is likely that the asymmetries are the result of intense chromospheric activity (Vinkó *et al.*, 1993) and the presence of cool starspots located primarily on the photosphere of the larger, more massive component of the system (Abbott & Rumignani, 1994).

The times of minima were found from our observations using a parabolic least squares fit to the data for both filters. The times of minima are presented in Table 2. These are mean times of minima obtained for both filters. The number of cycles elapsed (E) and O–C residual values are presented in Table 2; these quantities were determined using the ephemeris given above.

Table 2

HJD 2450000+	Type	E	(O–C)
363.7143	Primary	12724.0	– 0 <sup>d</sup> .0242
372.6210	Primary	12756.0	– 0 <sup>d</sup> .0234
388.6196	Secondary	12813.5	– 0 <sup>d</sup> .0276
390.5693	Secondary	12820.5	– 0 <sup>d</sup> .0261



**Figure 1.** The  $r$  (660 nm) and  $y$  (550 nm) light curves of VW Cep are plotted for Fall 1996. Delta-magnitudes are plotted versus orbital phase in which the phases are computed using ephemeris of Lloyd *et al.* (1992).

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