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PHOTOELECTRIC LIGHT CURVES OF PV CASSIOPEIAE

We have observed the eclipsing binary PV Cas (=BV72=BD+58°2554) during eleven nights between June 7 and September 1, 1970 with the 48 cm Cassegrain telescope of the Ege University Observatory. In these observations an unrefrigerated RCA 1P 21 photomultiplier was used with B and V of the UBV system.

Actually the light curves of this star were obtained by GEYER (1) eleven years ago. But in these light curves the secondary minimum was not seen and he proposed that this star had no secondary minimum.

Then POHL (2) has determined new light elements for this star as follow:

$$C: \text{Min JD } 2428\,796.8142 + 1^{d}.75047346.E \qquad (1)$$

The period obtained by Pohl is nearly double of that given by Geyer, and it is in good agreement with our observations. Table 1 shows the observed times of primary minima, O-C values against the elements given by Pohl, and the names of the observers. (Ib = C. Ibanoglu, Kt = M. Kurutac, Al = A. Caliskan, Od=O. Demircan, Hl = H. Sengonca, Rk=R. Akinci, Dn=H. Dönmez, Me=M. Meier, Pl=E. Pohl, Yy=Y. Yildiz.)

Table I

	O	O-C	Observers
2 440	129.381 pe	+0.002	Ib
	227.4061 "	+0.0002	Ib/Kt
	416.456 "	-0.001	Ib/Al
	479.475 "	+0.001	Ib/Od
	817.314 "	-0.001	Ib/Hl
	824.317 "	0.000	Ib/Rk
	831.3168 "	-0.0024	Ib/Dn
	852.321 "	-0.004	Me/Pl

Pohl has also proposed the following equation for the secondary minimum:

$$\text{Min I} - \text{Min II} = 0.516 \cdot P \qquad (2)$$

We obtained from our light curves:

$$\text{Min I} - \text{Min II} = 0.522 \cdot P \qquad (3)$$

Table II gives the observed times of the secondary minima, O-C values according to (2) and (3) respectively. The O-C residuals are decreasing.

Table II

O	$O-C_I$	$O-C_{II}$	Observers
2 436 851.5916	+0.0018	+0.0123	Geyer
895.3523	+0.0006	+0.0111	Geyer
440 515.320	-0.011	0.000	Ib
767.3886	-0.0103	+0.0002	Ib
830.4071	-0.0089	+0.0016	Ib/Yy

The light curves of PV Cas are shown in Figures 1 and 2, where the magnitude differences variable minus comparison star BD+58°2562 are plotted against phase using Pohl's elements. The star varies about $0^m.6$ in both blue and yellow. It is seen that both light curves and minima are similar. Probably the components are of the same spectral type and their diameters are approximately equal. The secondary minimum is displaced from 0.5 P. Hence PV Cas has an eccentric orbit. We need more observations to proof whether the decrease of the O-C values in Table II is caused by apsidal motion.

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References:

(1.) GEYER, E.H.: Zeitschrift für Astrophysik 51, 79, (1960)

(2.) POHL, E.: Information Bulletin on Variable Stars. 386, (1969)

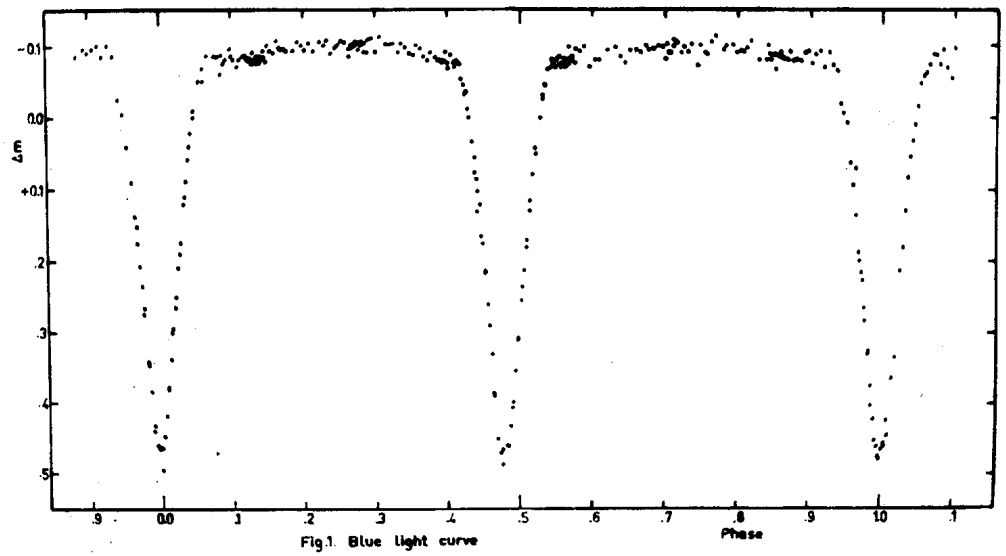

Fig.1. Blue light curve

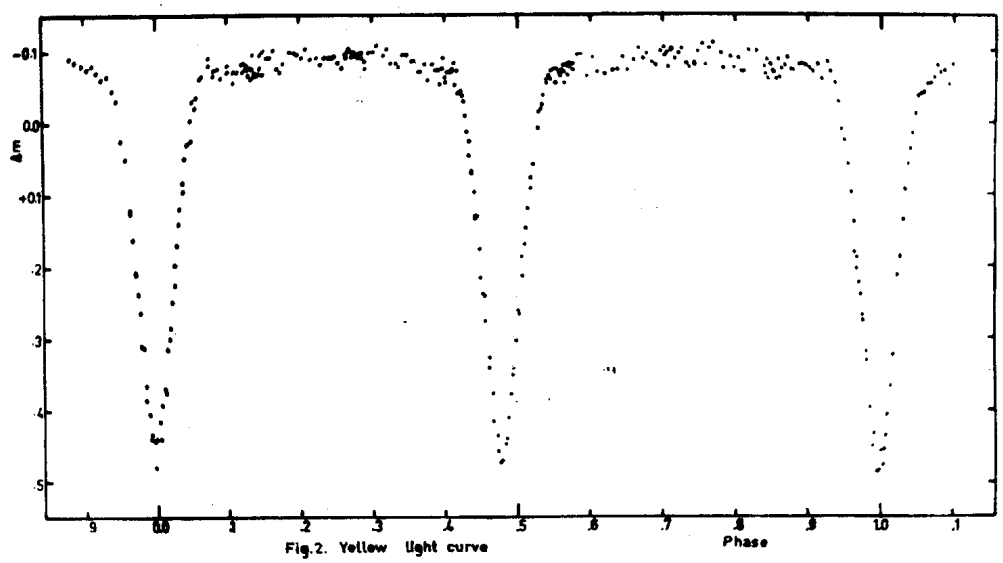

Fig.2. Yellow light curve