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THE FIRST PHOTOELECTRIC LIGHT CURVES AND THE PERIOD OF V 909 CYGNI

The variability of V 909 Cygni (HBV 318=BD +27^o3441) was discovered photographically by Wachmann (1963) who obtained 14 minima from his 416 photographic measurements. He classified the system as an Algol type eclipsing binary and gave the light elements as follows:

$$\text{J.D. Hel Min.} = 24\ 35\ 317.465 + 1^d4027080.E \dots\dots(1)$$

<u>+5</u>	<u>+83</u>
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He also presented the light curve of the system with 25 normal photographic points. There is no secondary minimum in his light curve and the depth of the primary minimum is about 0.^m42.

In order to check the light variation and the period of V 909 Cygni, we decided to observe it photoelectrically during the summer of 1982. Using the single channel UBV photometer of Ege University Observatory, attached to the 48 cm Cassegrain telescope, the star was observed on 14 nights. An unrefrigerated EMI 9781 A photomultiplier tube and B,V filters very close to the Johnson's standard system were used during the observations. BD +27^o3442 was used as comparison throughout the observing period. The extinction coefficients in separate colours for each night were calculated from the observations of the comparison star using the conventional method; then, all differential observations (variable minus comparison) were corrected for the differential extinction. The corrections were small, because the comparison star is very close to V 909 Cygni. Firstly we observed three minima; their E numbers were even according to Wachmann's light elements. The depths of these minima were equal. Then we observed another minimum. We saw that its E number was odd and it was considerably deeper than the previous ones. Therefore we decided that the period of the system should be twice that of given by Wachmann (1963). During the observations four primary and three secondary

minima have been obtained and are given in the following table.

The observed times of minimum

Hel.Min.J.D.	Min.	Filter	O-C
24 45 178.5261	II	B,V	-0.0009
192.555	II	"	+0.001
195.3592	II	"	-0.0003
202.3736	I	"	+0.0005
216.4002	I	"	0.0000
230.4288	I	"	+0.0015
261.2870	I	"	0.0000

Using the above new photoelectric minimum times and the photographic ones given by Wachmann (1963), the new light elements are calculated by the method of weighted least squares as follows:

$$\text{Min. I} = \text{J.D. Hel } 24 \ 45 \ 202.3731 + 2.8054230 \cdot E \dots\dots(2)$$

+19
+10

The light and colour curves of the system are presented in Figure 1. The phases in the Figure and the O-C values in the table were calculated with the equation (2).

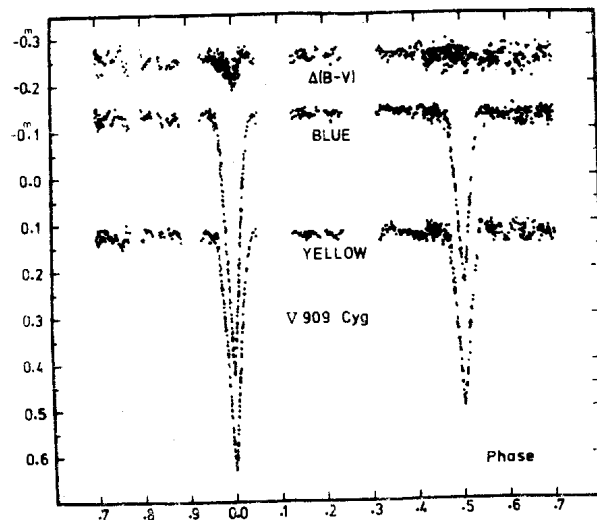


Figure 1

The light curves show that V 909 Cygni is a typical well-detached Algol type eclipsing binary. The colour of the system is slightly reddening at the primary minimum and varies about $O^m.540$ and $O^m.500$ at the primary, $O^m.360$ and $O^m.360$ at the secondary minimum in blue and yellow light, respectively. The solutions are in progress.

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Reference:

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