A 2.2 μm LIGHT CURVE OF THE ECLIPSING BINARY VW CEPHEI

The star VW Cephei is a triple system (Hershey 1975)
with a W UMa type eclipsing binary (components A and B; subclass W
according to Binnendijk 1970) and a remote companion (C) of estima-
ted spectral type K7V, while G8 is obtained for (A+B). Due to a
0."64 separation between (A+B) and (C), the three lights are included
in photometric measurements. Variable period as well as variable
light curve have been reported (Kwee 1966 a, b - Van't Veer 1973 -
Rovithis and Rovithis-Livaniou 1980 - Niarchos 1980). Various models
have been proposed for the latter phenomenon (Kwee 1966 a - Leung
and Jurkevich 1969 - Van't Veer 1973 - Pustylnik and Sorgsepp 1976)
in term of spots and/or circumstellar gas. The observed period
shortening possibly contradicts the thermal oscillation theory
(Linnell 1980). See also Walter 1979 for a precessional model.

Since the infrared observations we reported for
VW Cephei (Lunel et al. 1979) the 77°K PbS photometer was abandoned
for a more sensitive InSb version. New observations at $\lambda = 2.2$ μm
(K window) were made at the Cassegrain focus of the 80 cm telescope
of the Observatoire de Haute-Provence (CNRS France) during the night
of 1980 October 25 (Fig. 1). The star BD +75°764 was used as a
comparison star.

No strong perturbation can be ascertained in the light
curve, despite the improved signal to noise ratio. The mean amplitude
of 0.22 mag. at $\lambda = 2.2$ μm as precedently quoted (Lunel et al. 1979)
is confirmed. The total flux of the system at maximum light is the
same as the one observed in January 1976. The difference between
maxima heights is only 0.01 mag. while the difference between minima
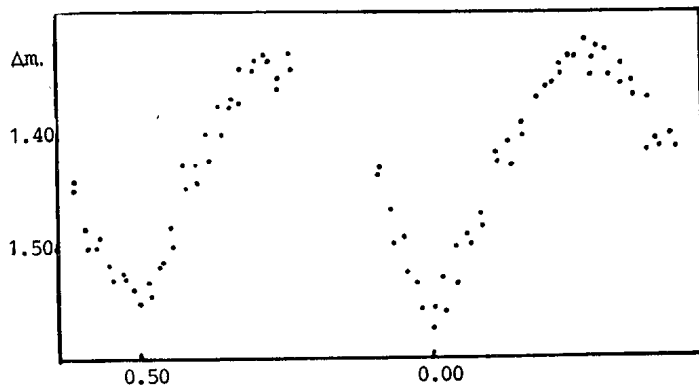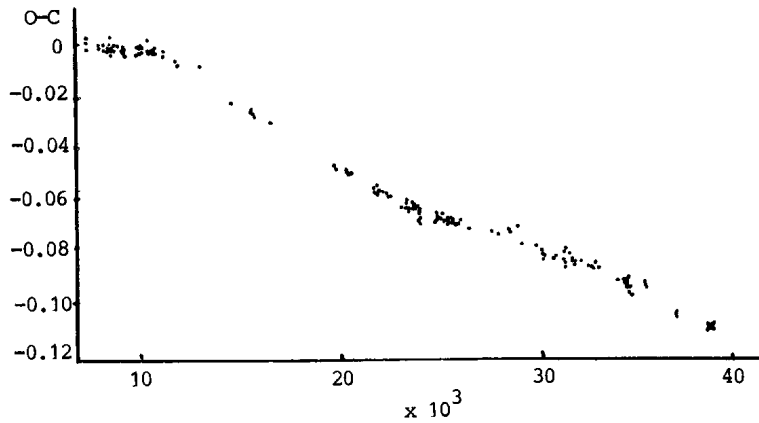is about 0.024 mag. According to Heinz (1975) component C is 2.9 mag.

Figure 1

Figure 2

fainter than (A+B) at maximum in visual light. Assuming for C the
spectral distribution for a K7V star, a F(A+B)/F(C) = 4.4 light ratio
is deduced at 2.2 µm to be compared to 14.4 in visual light. The
observations of Fig. 1 can then be corrected for the third light,
using the former ratio. The mean amplitude then becomes 0.28 mag.

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The epoch of the primary minimum has been determined by the method of Kwee and Van Woerden (1956). We obtained :

J.D. 2 444 538. 4223   and   O - C = - 0.1131

in good agreement with the O-C diagram as established by Van't Veer (1973) and Hopp et al. (1979). See Fig. 2 .

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