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ON THE PERIOD OF THE W UMa SYSTEM ϵ CrA

ϵ CrA was found to be a binary in 1950 by Cousins and Cox. Cousins (1964) published a photographic light curve and reported a small variation of the period. Knipe (1967) made observations with blue and yellow filters. (See also measurements by Binnendijk, 1965.) The primary component of ϵ CrA is a star of spectral class F5 and the secondary cooler component is of type G0. This W UMa system is an A type one (transit at primary minimum).

Since 1965, Tapia (1969) and Hernandez (1972) have published UBVRi observations obtained in 1967. Their observations are well represented by the following ephemeris:

$$\text{HJD}_{\text{minI}} = 2,439,707.^{\text{d}}6619 + 0.^{\text{d}}5914264 \text{ E}$$

Tapia concluded that the period had remained constant for 17 years.

One of us carried out infrared observations of ϵ CrA at the ESO 1m telescope during the nights of July 2/3 and 3/4, 1982 (Lunel and Bergeat 1983). The period of the system is somewhat over 14 hours. Hence a substantial part of the cycle was covered each night, in a 12 hours interval centred on the meridian transit. The InSb photometer was used with a K-Band filter (2.2 μ) and γ CrA was used as a comparison star. 140 individual observations were obtained during the first night (of better photometric quality than the second one). The observed minimum occurred later than the epoch computed from Tapia's elements. We found

$$O-C = 0.^{\text{d}}0691$$

Alternatively, the discrepancy could be explained if we accept for 1967-1982 a period larger than Tapia's, i.e. $P = 0.^{\text{d}}5914345$.

The difference is then $0.^{\text{s}}7 = 8 \times 10^{-6}$ d, well above the accuracy of $\pm 10^{-7}$ d quoted by Tapia (1969). Here some doubt arises since his pinpointing of the period on the 1950-1967 time basis relies on the early 1950 photographic observations published by Cousins (1964). Clearly more observations were needed.

In 1983 uvby observations were made with the Danish 50 cm telescope at ESO during the nights of June 22/23 and 23/24. Despite bad weather conditions a primary minimum was determined from the observations in V, which confirm the results of the infrared observations of 1982. The epoch of the minimum is 2,445,509^d.63, resulting in

$$O-C = 0.075^d \text{ if Tapia's elements are used.}$$

Hence we are able to confirm the elements:

$$HJD_{\min I} = 2,439,707.6619 + 0.5914345 E$$

as published by Lunel and Bergeat (1983).

The authors' contention is that a period variation remains to be established. A regular monitoring of this system would be useful.

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