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O – C ANALYSIS OF SV Cam OVER A CENTURY

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The RS CVn star SV Cam (HD 44982, SAO 1038, HIC32015, G2-3V/K4V, SB1, $m_{V_{\max}}=9.34$) is a totally eclipsing binary system with a short orbital period of 0.59 days. The system has been studied mainly photometrically since the 30-ties (Guthnick, 1929) and both components display magnetic activity similarly to the Sun. The presence of a third body was considered by several authors (e.g. Sarma et al., 1985 or Albayrak et al., 2001). The following *O – C* analysis covers the years 1896 up to 2002 and thus represents more than 60,000 orbits.

The following linear ephemeris (Pojmański, 1998) has been used

$$\text{MinI} = \text{HJD } 2\,449\,350.3037 + 0^{\text{d}}.593071 \times E \quad (1)$$

The final *O – C* analysis consists of all primary minima from several database-like sources including recent observations by Zboril (2002). Most of these data are based on Albayrak et al.'s (2001) collected minima and, finally, from Hall and Kreiner (1980), Pierce (1938) and Wood (1946). Another potential source (Albayrak et al., 1999) contains mainly visual observations which did not improve the *O – C* diagram. The times of minima in Table 1 (only available electronically via IBVS Web-page as file 5303-t1.txt) were processed according to the equation (1) and the *O – C* residuals are displayed in Figure 1. The data suggest a quadratic term plus a sinusoidal variation. We fit the data with such an equation which gives the final ephemeris of:

$$\begin{aligned} \text{MinI} = & \text{HJD } 2\,449\,350.3045 + 0.5930718 \times E + 0.11075 \cdot 10^{-10} \times E^2 + \\ & \pm .0013 \quad \pm .0000017 \quad \pm .0001 \\ & + 0.0086 \times \sin[2\pi \times (E - 3319.6)/36073.77301] \\ & \pm .0004 \quad \pm 3.3 \quad \pm 4.8 \end{aligned} \quad (2)$$

The *O – C* residuals give further support for the existence of a third body orbit with a period that is close to that derived in Sarma et al. (1985), i.e. approximately 50 years. Note though that the first few observations (3 points in 1896) are uncertain.

If only the more precise photoelectric minima are considered the period from Albayrak et al. (2001) is confirmed. As pointed out by them, adopting the distance by Hipparcos,

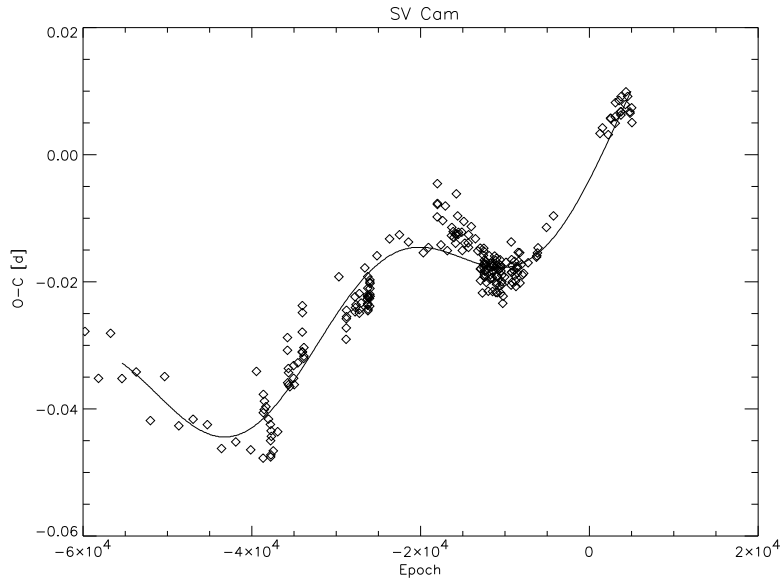


Figure 1. $O - C$ residuals based on the equation (1) for SV Cam and the fit with the equation (2).

the angular separation of the third body from the eclipsing pair is about $0''.19$ and should be observable.

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