COMMISSION 27 OF THE I. A. U.
INFORMATION BULLETIN ON VARIABLE STARS
Number 2313

Konkoly Observatory
Budapest
18 April 1983
HU ISSN 0374 - 0676

RADIAL VELOCITY VARIATION OF THE Be STAR 6 Cep (HD 203467)

6 Cep (HD 203467, HR 8171, BD+64°1527, SAO 019313, MWC 367) is a bright B emission star. Long-term spectral variation was disclosed by Hubert-Delplace and Hubert (1979) and by Slettebak (1982). Kodaira (1971) analyzed the radial velocity measurements of this star and concluded that 6 Cep is a spectroscopic binary ($P = 1^d.12215$, $K = 12$ km/s). These parameters place 6 Cep at the edge of the region where the RV variation can still be interpreted as a consequence of the motion in a binary system containing B-type star.

Recently, several Be stars showing periods close or shorter than 1 day were studied and other interpretation than binarity was proposed: 28 CMa - Baade (1982); λ Eri - Bolton (1982); EM Cep - Rachkovskaya (1975), Hilditch et al. (1982); LQ And - Percy (1983), Harmanec (1983).

Our analysis of the data used by Kodaira (1971) revealed that the period $1^d.12215$ is not the only one to fit the RV measurements. Moreover, the least-squares solution led to lower value of K (6.3 km/s), see Fig. 1a. Clearly, the problem of the interpretation of 6 Cep can only be further resolved by collecting new spectroscopic and also photometric (only few available so far) observations.

This communication deals with a more detailed analysis of RV variation of 6 Cep. The results are based on 80 values of RV. 30 values are from the paper by Kodaira (1971). 18 values were measured on spectrograms obtained with the coudè spectrograph of the 2 m PCC telescope (Ondřejov Observatory) and 32 values were derived from the measurements on spectra taken with the coudè spectrograph of the 2 m RCC telescope (National Astronomical Observatory at Rozhen, Bulgaria).

The data are not homogeneous. Different dispersions, emulsions, methods of RV determination and sets of lines were used. Therefore, two files were formed. File A contains all 80 values, while in the file B only the reliable measurements were included. File B is represented by 19 RV measured by Kodaira (1971) on Mt. Wilson plates and by 32 RV measured on Rozhen spectra. The

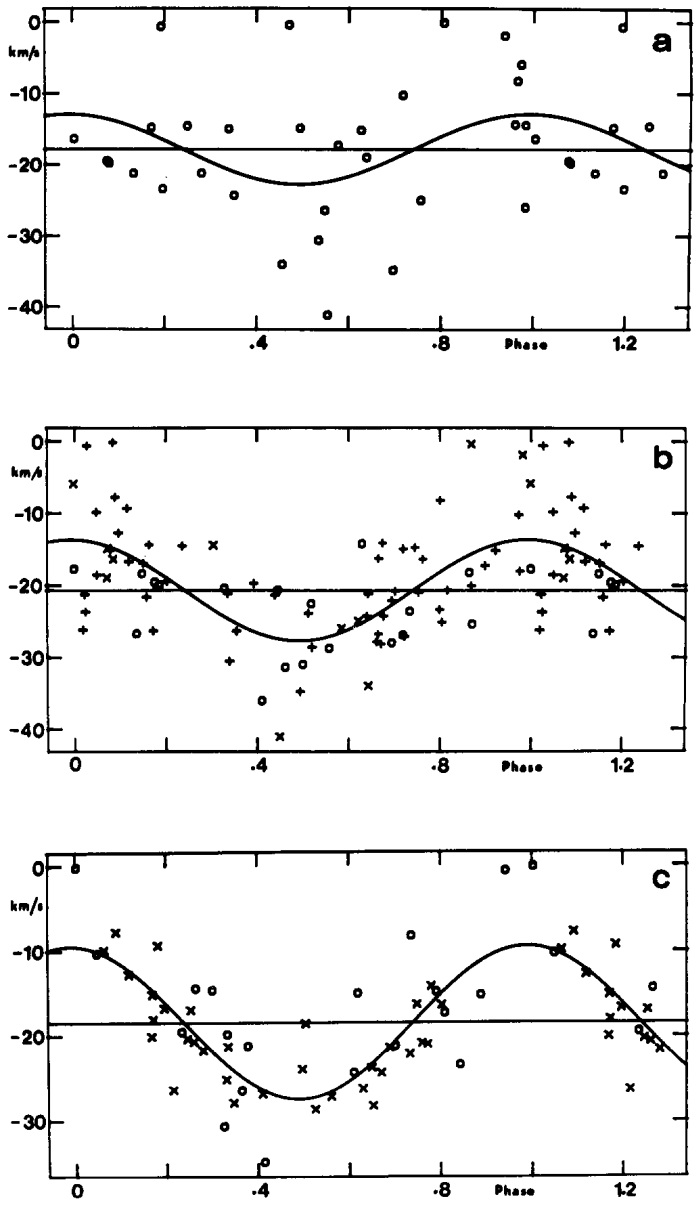

Figure 1. Radial velocity curves for 6 Cep
a) data used by Kodaira (1971), P = $1^d.12215$, K = 6.3 km/s
b) data of file A, P = $2^d.438942$, K = 7.0 km/s
c) data of file B, P = $0^d.708469$, K = 9.0 km/s

second file is reasonably homogeneous. Kodaira (1971) determined the RV with the Grant machine from H lines, while the RV of the Rozhen plates were measured on tracings derived from Ondřejov five-channel microphotometer scans. Usually, the positions of 8 H lines (H8 - H15) served for RV determination.

Both files were analyzed for possible periods. The best-fit period to data of file A is $2^d.438942$. The least-square solution is presented in Fig.1b ($K = 7.0$ km/s, $f(m) = 0.875 \cdot 10^{-4}\ m_\odot$). The data of file B were better fitted by the period $0^d.708469$. The least-square solution is shown in Fig. 1c ($K = 9.0$ km/s, $f(m) = 0.528 \cdot 10^{-4} m_\odot$). Both periods are interconnected but the ambiguity cannot be solved with the available data.

The results can be used for testing the binarity of 6 Cep. Adopting the mass of the visible star (B2.5 Ve) $m_1 = 10.4\ m_\odot$ and inclination $i = 25^\circ$ ($v \sin i = 150$ km/s), we derive the mass of the unseen component $m_2 = 0.5\ m_\odot$ (file A), $m_2 = 0.4\ m_\odot$ (file B). The derived values of m_2 are not in conflict with the binary interpretation of 6 Cep. But one should stress that the $0^d.7$ period is close to the rotational period of the star. Obviously, further constraints could be placed on the model of 6 Cep if good photometric data are available.

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