

B[e] Star CI Cam: Eighteen Years of Research

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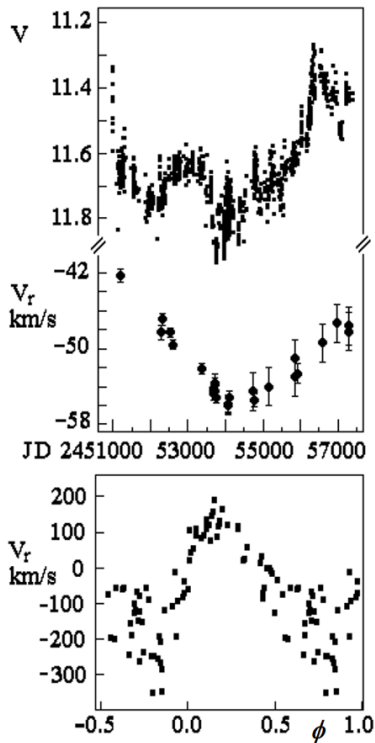


Figure 1: The V band light curve after the 1998 event and the radial velocity curve for Fe II lines (top). Radial velocities for the He II 4686 Å line versus phase of the 19.4 day period (bottom).

CI Cam was identified as a source of a transient event observed in all ranges of the electromagnetic spectrum in April 1998. This event was interpreted as a thermonuclear runaway on the surface of a white dwarf (WD) in a shell accumulated from the wind of the B[e] star. The WD was detected by spectroscopy in a single line, He II 4686 Å, whose radial velocity varies with an amplitude of about 500 km/s and a period of 19.40 day. Also a gradual shift in radial velocities was discovered in narrow emission lines of a circumstellar nebula, Fe II and even forbidden line of [N II] 5755 Å. The B[e] star turned out to be a double-mode pulsator that is typical of Be stars but is unique in stars with the B[e] phenomenon. The pulsation periods are 0.4152 and 0.2667 day. Recent echelle spectra show that the trend of radial velocity in narrow emissions has reversed. This suggests the presence of a third companion which is indistinguishable in the spectra but affects the B[e] star along with its gaseous environs. The third component shifting the nebular lines is located on a highly elliptical orbit with an immeasurably long period. It seemed to have passed close to the B[e]/WD pair in 2008. A few years later, the B[e] star began to brighten and reached a maximum amplitude of 0.4 mag in 2012. The He II line became stronger and was seen well in almost all spectra, while its appearance before the approach was a rare case. If this line is radiated in the accretion disk around the WD, the observed radial velocity curve variations may be explained by the change of WD orbital elements. Our research strongly suggests that CI Cam is an interacting triple system.

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