

H α radial velocity observations of γ Cas

(by Roland Bücke and Ernst Pollmann)

Since the investigations by Harmanec et al. [1] in 2000 and Miroshnichenko et al. [2] in 2002, the radial velocity behaviour of the H α -emission and its period of 203 days has been known. In September 2006 the authors also started long-term monitoring of this radial velocity variation and the measurements obtained are shown in Fig. 1.

The RV values of Christian Buil (red symbols) have been calculated from his BeSS spectra. The current measurements reveals a long-term change, which can be fitted to a sinusoidal period of 1434 days (Fig. 3). By removing this long-term period, we achieve a clearly improved behavior of the Fig. 1 period, shown in Fig. 2. From these first intermediate results we would like to draw the following conclusions:

1. A continuation of the monitoring during a longer period should permit an improvement of the orbit elements.
2. The long-term variability of the radial velocity is probably caused by changes of the H α line profile, but this assumed connection requires a more exact analysis. The proposed sine fit in Fig. 3 covers the past 1517 day observation section with only one period. Whether we did actually find a long-term periodicity here can be only analysed by further measurements.
3. Our data set could be extended by the evaluation of BeSS spectra. We would like to regard this as proof of the high value of amateur observations in this data base. Interested amateurs are encouraged to take part with their own measurements in the future monitoring the radial velocity of γ Cas.

We thank Christian Buil for the use of his BeSS spectra.

- [1] Harmanec, P. et. al., Properties and nature of Be stars, XX. Binary nature and orbital elements of γ Cas, *Astron. Astrophysics* 364, L85-L88 (2000)
- [2] Miroshnichenko, A.S., Bjorkman, K.S., Krugov, V.D., Ninary Nature and Long-Term Variations of γ Cassiopeiae, *The Astronomical Society of the Pacific*, 114:1226-1233, 2002

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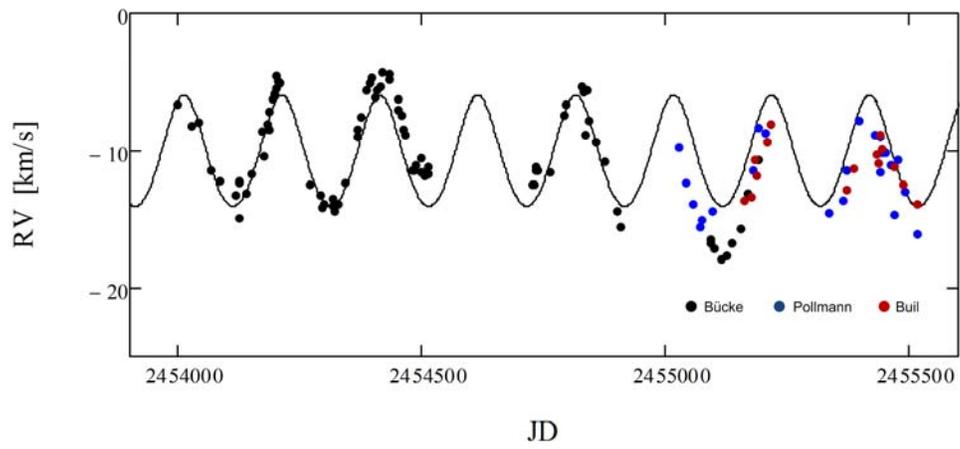


Fig. 1: Measurements of the radial velocity period = 201 d

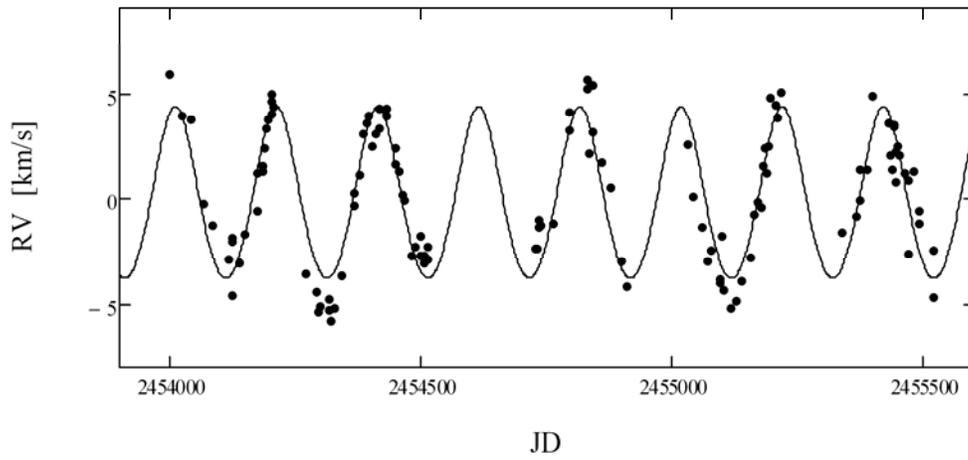


Fig. 2: Behaviour of radial velocity (P = 201 d) after removal of the long-term period.

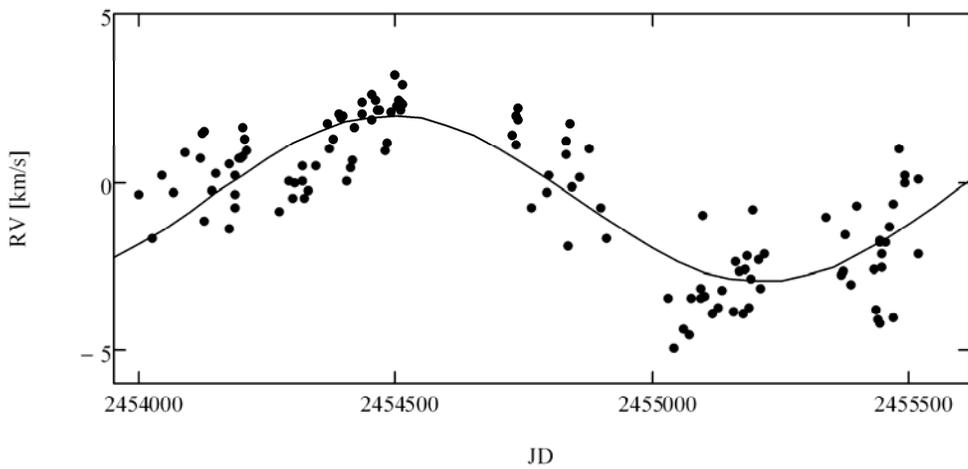


Fig. 3: Long-term residual period by sine fitting P ~ 1434 d