

## November 2014 RV minimum and HeI6678 line profile disturbances in $\gamma$ Cas

A group of ARAS observers is observing the star for monitoring in different ways. Their spectra offer, among others, the possibility of measuring the H $\alpha$  RV. Since July 2014 they have collected high quality spectra for measuring the H $\alpha$  RV and hence for observing its minimum in November 2014. Fig. 1 shows the RV time behavior for that time span. Based on the ephemerides of Nemravova et al. (2012) the RV minimum was to be expected at JD 2456975. Our RV minimum appears at approx. JD 2456982, followed by a fairly quick rise.

Harmanec et al. (2000), Miroshnichenko et al. (2002), Nemravova et al. (2012) & Smith et al. (2012) reported the detection of the regular radial velocity (RV) variations of the H $\alpha$  and He6678 lines with a period of 203.59 days, and an orbital eccentricity  $e = 0.0$  (Nemravova et al. 2012),  $e = 0.0-0.03$  (Smith et al. 2012) &  $e = 0.0$  (Miroshnichenko et al. 2002). They attributed them to the orbital motion in the Be binary system  $\gamma$  Cas. The secondary has mass of about 0.8 solar (or less), appropriate for a white dwarf (or a neutron star?), but it also could be a “degenerate companion” (or a low-mass main sequence star).

An independent monitoring of the V/R variability of the He6678 line of Pollmann (Fig. 2) shows the He6678 double-peak emission profile during that time section. There, one can clearly recognize the disturbances of the blue component of the line profile at JD 2456983 to 2456990. The disturbances in the sense of a tidal interaction of a companion star and a gas disk/shell around the primary star during a periastron passage is, meanwhile, well known and so far is not new. But because of  $e =$  almost 0.0, there is no special meaning to the RV minimum in the star’s orbit, and the HeI6678 line profile disturbances can be seen only as a contemporaneous coincidence. On the other hand, if the changes in the HeI line are true, they are caused very close to the Be star.

About 2 hrs for temperature stabilisation of all the equipment were waited, before spectra were taken. In addition the climatic conditions were rarely good. The high quality standard of the He6678 spectra (S/N mostly better than 700) does not leave any doubt about the reality of the observed line profile structure. Nevertheless, it remains to wait, whether a similar line profile disturbance can be observed during the next RV minimum in 203 days.

### Reference

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