

ACCRETION ON THE ECCENTRIC BINARY SYSTEM DQ TAU

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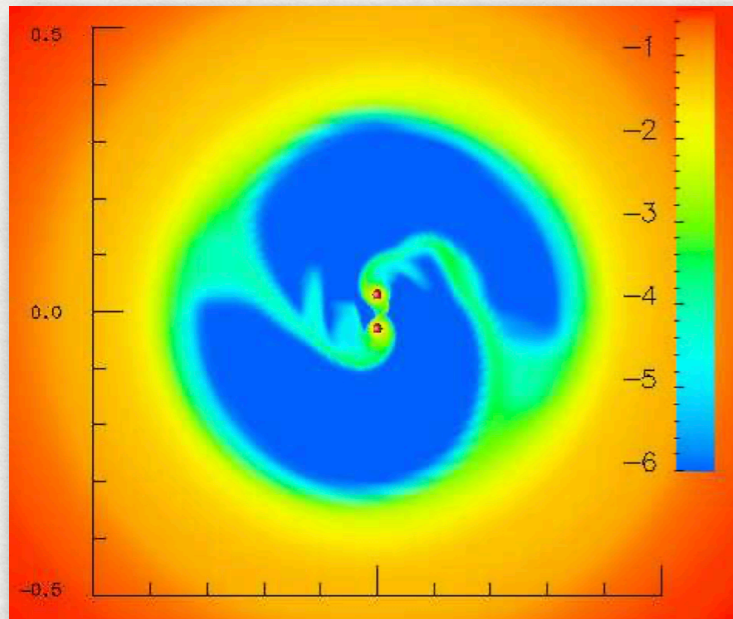


Fig. 1 Günther & Kley 2002: DQ Tau simulation at periastron.

The mass accretion rate is larger at periastron, confirming the pulsed accretion model

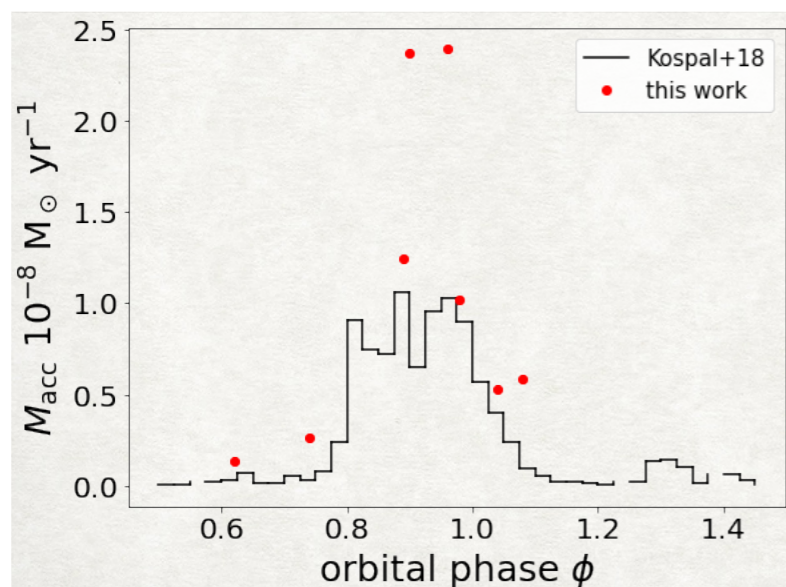


Fig. 2 Mass accretion rate as a function of the orbital phase

Eccentric binary system experience a particular type of accretion process. Because the two stars are so close to each other, there is no circumstellar disk, and the circumbinary disk is thought to behave as the circumstellar disk for single stars. DQ Tau is the archetype of the equal-mass, highly eccentric, close binary systems.

We studied 8 X-Shooter spectra of DQ Tau, observed between 18 Nov.2012 and 11 Mar. 2013. After subtracting the photospheric, chromospheric and veiling contribution, we measured the line fluxes of the accretion tracers. We computed the mass accretion rate (Fig. 2) using empirical relations between accretion tracers and the accretion luminosity (Alcalà+17), and the stellar parameter by Czekala+16. We computed the radial velocities of the two components (red and blue vertical dashed lines in Fig. 3), so that we were able to determine the main accretor during each epoch (Fig. 4).

The main accretor changes up to three times within only two periods

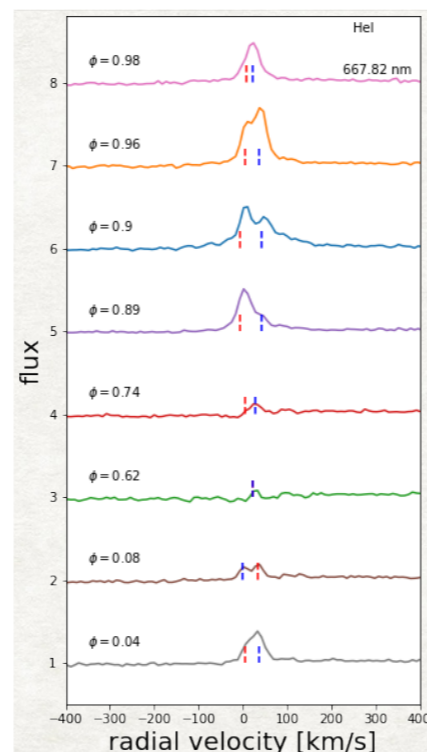
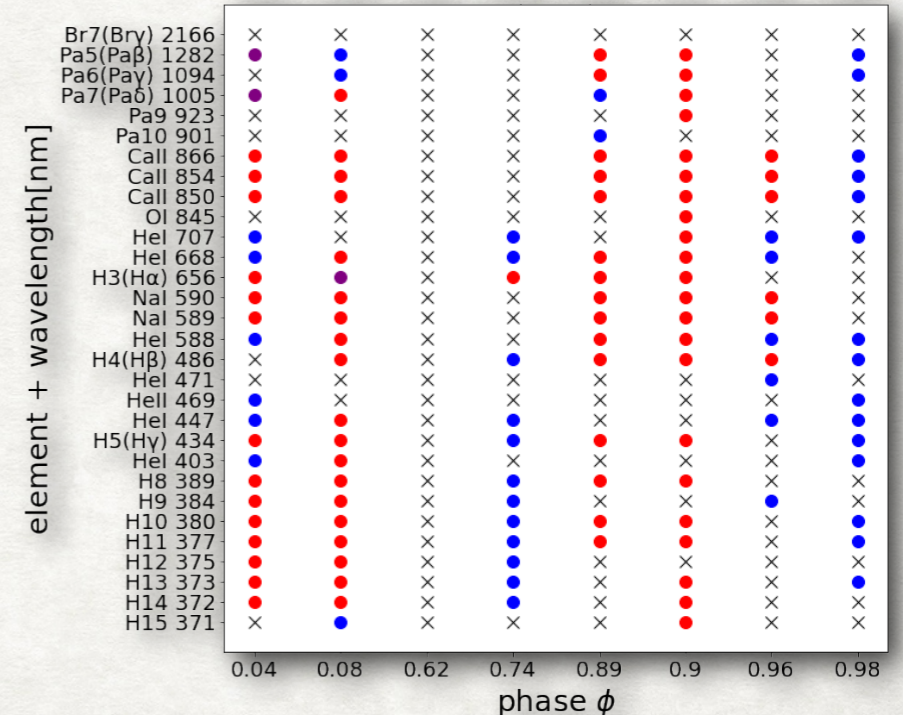
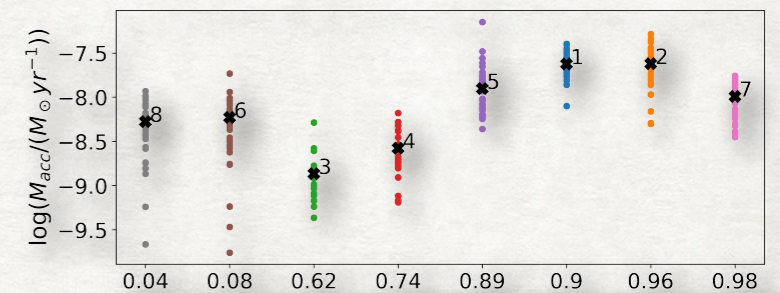


Fig. 3 Velocity structure of continuum normalised He I 667.82 nm. The colours of the lines correspond to the epochs in the bottom panel of Fig.4

Fig. 4 Red and blue circles identify the primary and the secondary as the main accretor, respectively. Purple circles correspond to equal accretion on the components



FOR FURTHER DETAILS: STAY TUNED! Fiorellino et al. is submitted!