

The V/R ratio in ζ Tau

The V/R monitoring of the H α emission of ζ Tau (Fig. 1) shows a significant decrease in the difference between the V/R maxima and minima (= V/R amplitude) within the time period considered here, from April 1991 to the present (~ 21 years). This V/R amplitude is shown in Figure 2, on the average time between maximum and minimum in each of the ascending branches.

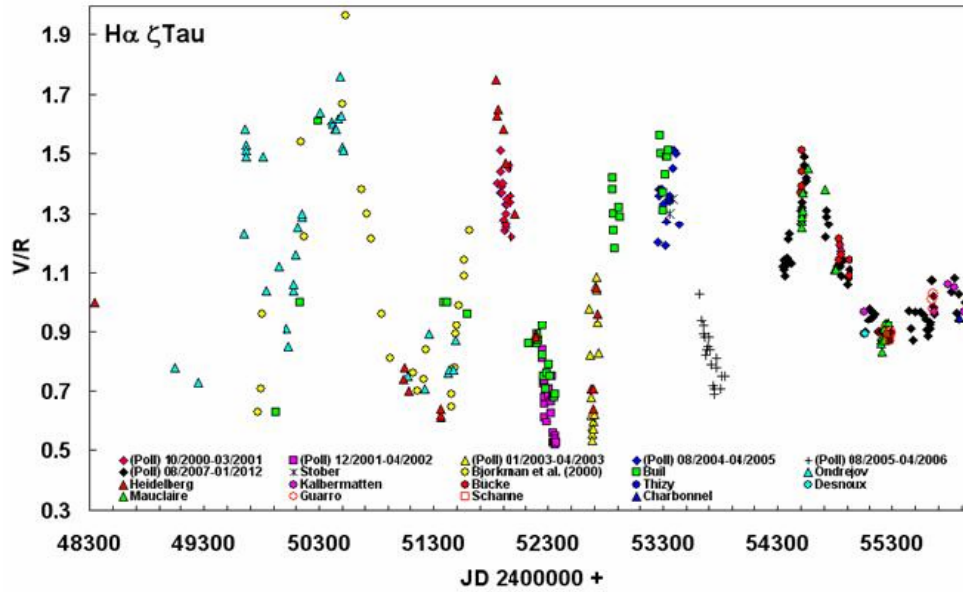


Fig. 1: H α - V/R longterm monitoring from April 1991 until January 2012

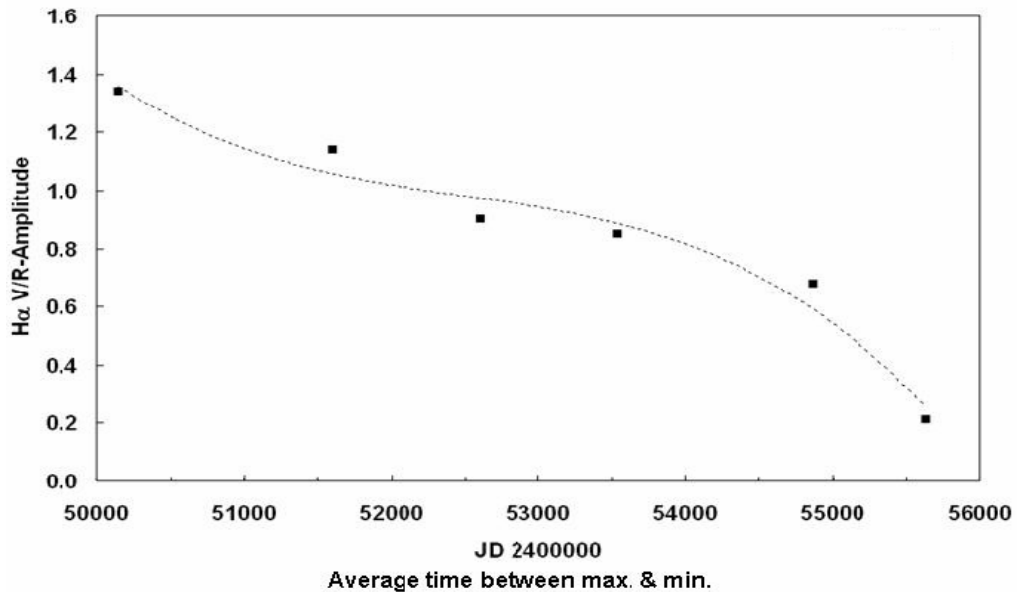


Fig. 2: Reducing of the V/R amplitude versus time for the observation period in Fig. 1

The question is, what are the physical causes in the Be star disk, which lead to this decrease. In general, the periodic variation of the V/R ratio of ζ Tau represents local density differences in the precessing Be star disc (period ~ 1400 days, see Figure 3). Against this background, one could assume that the previously observed difference in density in the disk within the time period considered here is almost balanced.

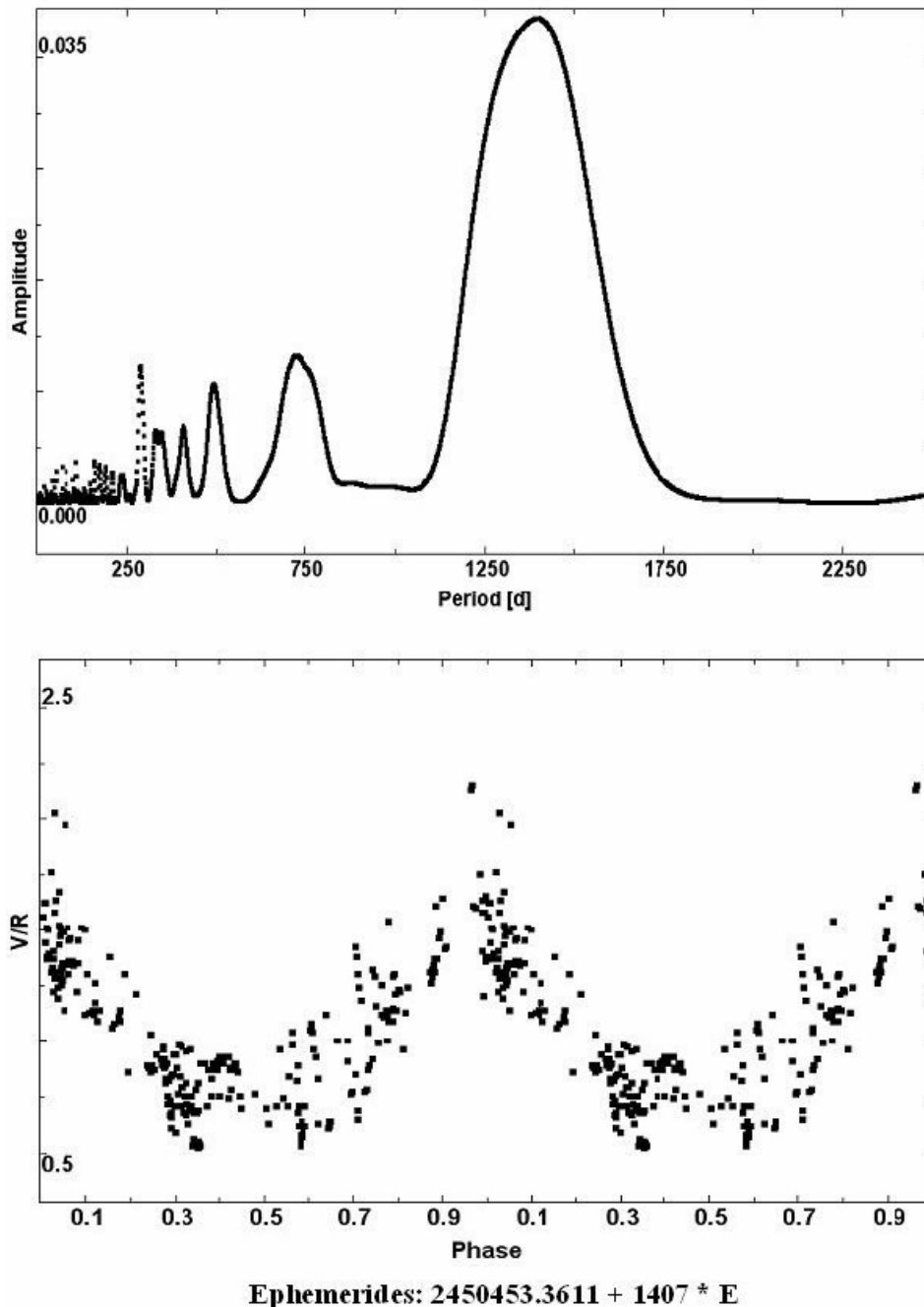


Fig. 3: V/R period analysis; above: Scargel periodogram, below: phase plot

It is remarkable that this amplitude reduction is associated with the fact that the H α -EW is currently at a historically low level (see Figure 4), which means nothing else than that the total mass of the circumstellar disc on a minimum is decreased, similarly as in the winter 1988.

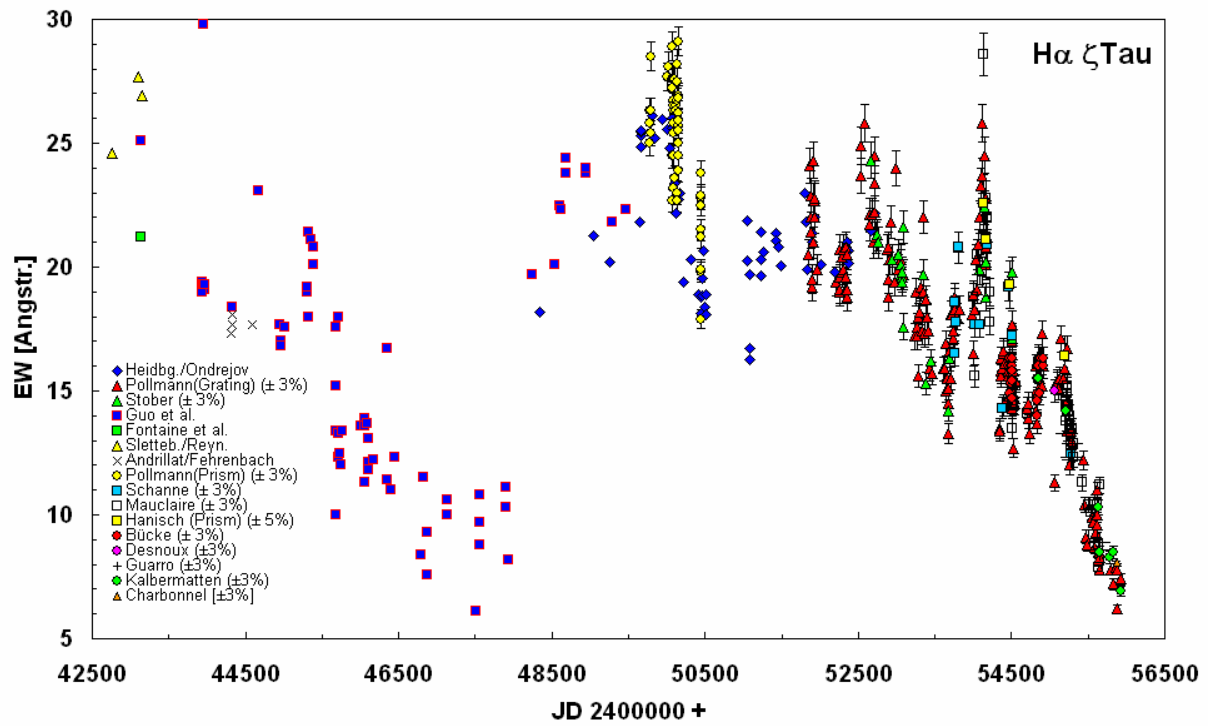


Fig. 4: H α longterm monitoring of ζ Tauri

Thus could a density equilibration with the observed V/R amplitude reduction be an indicator of the expectation of the mass loss of the circumstellar disk?

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