G P15 A search for rapid radial velocity variation in cool Ap star HD 965

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HD 965 is a slowly rotating cool Ap star with a strong magnetic field. The star has a core-wing anomaly in the Balmer lines. Many of the characteristics of HD 965 are typical for roAp stars. This star has been shown to have no rapid photometric variability with amplitude more then 0.2 mmag in the frequency range of the roAp stars. There are several possible reasons for the negative result in photometry. (i) The star belongs to the group of cool, non-rapidly oscillating Ap (noAp) stars and does not have any rapid variations; (ii) The star has rapid oscillations with amplitude below 0.2 mmag; (iii) The photometric observations were made in only one set. For roAp stars the oscillations are strongest when a star is observed from the magnetic poles and weakest when observed towards the magnetic equator.

Recently it was found that rare earth elements, especially spectral lines of Pr III and Nd III, show strong variation of radial velocities with the period of photometric oscillations in roAp stars. This is a new additional way to study rapid oscillations.

We present results of a search for rapid radial velocity variation of spectral lines of rare earth elements and some other chemical elements in the cool Ap star HD 965 in spectra obtained with ESO VLT UVES spectrograph.