

UV and optical spectrum variability of T Tau and RY Tau

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Abstract. In this report we have presented results of spectral observations of classical T Tauri type stars T Tau and RY Tau. Observational dates were obtained from following sources: spectrograms of the UV range from the IUE archive data, and spectrograms of the visual range obtained in the 2 m telescope of ShAO of the NAS of Azerbaijan (Ismailov *et al.* 2010). For both of stars on the Scargle method we have searched a periodicity of variations in equivalent widths of emission lines in the optical and UV ranges. In the RY Tau firstly was detected the periodic variability in MgII $\lambda 2800$ Å emission doublet intensities with a period of 23 days. The observed period had also revealed with the equivalent widths and displacements of components of H α and H+H ϵ and K CaII emission.

The lines were found to be shifted to short wavelengths as the emission line intensities increased in both UV and optical spectral ranges. The lack of a correlation between the brightness variation and the emission line intensity also suggests that, on the whole, the contribution from the radiation in emission lines for the star RY Tau is insignificant.

On the analysis of T Tau we conclude that there is a significant variation of spectral emission lines in the optical and UV on a time scale of about 33 days and that this variations is periodic. Both of stars shows the periodicity also for observed group of such lines as CIV $\lambda 1450$ Å, HeII $\lambda 1640$ Å, SII $\lambda 1756$ Å (Ismailov *et al.* 2010, Ismailov *et al.* 2011).

Additionally we have carried out spectral energy distributions of this stars in the range 0.36-100 μ m which have indicated the excess of spectral radiation in the IR range of spectrum. These excesses of radiations can be explained by the thermal radiation of still unformed bodies at the circumstellar environment. The periodic variability in the spectrum together with the excess of the spectral radiation may be occurred by protoplanets and/or protostars in these young systems. It is showed that possible, planet formation processes mainly to be completed at the time of the formation of classical T Tauri type stars.

Keywords. stars: pre-main-sequence — planetary systems: formation

References

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