THE UNUSUAL SPECTRUM OF FS TAU B REFLECTION NEBULA: AN INFLUENCE OF THE ACCRETION DISK?.

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The PMS star FS Tau B is a well-known object with collimated outflow (Mundt et al.,1984; Eisloeffel and Mundt, 1998; Woitas et al., 2002). It illuminates a compact triangular reflection nebula, detached from the star, and also some more distant faint reflection structures. Here we present the results of Fabry-Perot scanning interferometry of this object in Hα line. Observations were carried out at 19.9.2001 with 6 m telescope at SAO (Russia).

We intended to study not only the collimated outflow itself, but also to compare the profiles of Hα line from the star itself and from the reflection nebula. The strong difference between the Hα profiles in the star and in the nebula was revealed. It is shown at Fig.1.

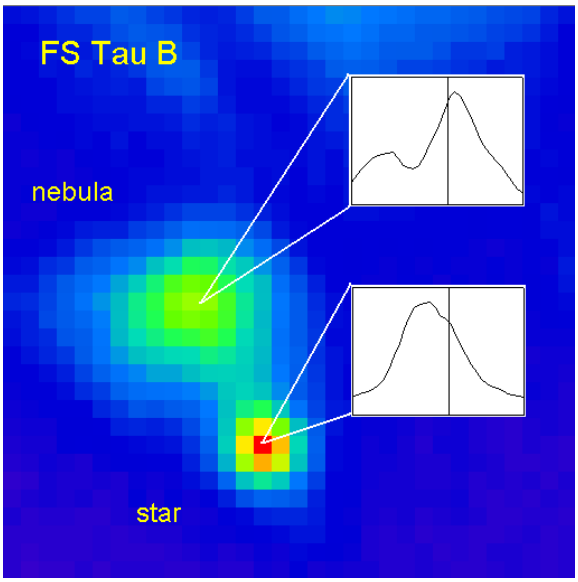

Figure 1: Profiles of Hα emission line in the FS Tau B star and in its reflection nebula

The Hα line profile which corresponds to the light, coming directly from the star, shows a broad emission, where two components can be discerned. One component has nearly zero velocity, another one is stronger and somewhat blueshifted. The median radial velocity of this profile is -34 km/s. In contrast, the profile of the Hα in the reflected light is double-peaked with deep division between them. The velocities of peaks are $+55$ and -178 km/s. Notwithstanding the compactness of the nebula, we also detect the visible variations in this profile: with the increase of the distance from the star the double-peaked structure appears more and more pronounced. We also measured the radial velocities of the bipolar outflow and found that they are close (within ± 10 km/s) to the previously determined values (Eisloeffel and Mundt, 1998).

The origin of this obvious difference in Hα line profiles can be attributed to their dependence on the star's latitude, because the reflected spectrum of the nebula actually corresponds to pole-on line of sight. It can be possible, that in this direction the contribution of the light from the boundary layer of the circumstellar accretion disk becomes more pronounced. Other explanations also can be suggested. This object can be a good target for the theoretical analysis and modeling.

References

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