

## THE SPECTRAL VARIATIONS OF VY MON IN 1986–1992

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**ABSTRACT.** The variations of the 3-component profiles of the spectrum of VY Mon are reported which may be explained by restricted models of variable anisotropic stellar wind.

**Key words:** Stars: young, mass loss, VY Mon.

The young star VY Mon is very variable object. The changes of brightness, emission line profile and polarization give the evidence of circumstellar envelopes existence where different physical processes such as: photoionization, outflow, accretion in dynamical inhomogeneous space take place.

VY Mon is one of the youngest four stars with infrared radiation excesses (LkHa 198, HL Tau, VY Mon, R Mon – Cohen and Schwartz 1976). The spectral data for VY Mon with enough resolution are not available but the data of Cohen and Kuhl (1979) with resolution 7 Å.

Our spectral observation program have been in 1986, the first spectragramms with resolution 2.7 Å show Ha emission line with P Cyg peculiarity. The estimate of mass outflow rate is  $2 \cdot 10^{-6} M_{\odot}/\text{yr}$  (Pavlova 1992).

Following results have been obtained during 1986–1992: three types of Ha profile can be seen in the spectrum: the profile with P Cyg absorption, the profile with blue emission and single emission profile. All three types are typical for the majority of the young Ae/Be Herbig and T Tau stars. In one object we can see some processes each of which take place in other stars. The measuring of the spectral features shows that displacement of peculiarity at first continuously increases and then decreases. We have not embraced the whole period of existence of each type profile, but in according to the last data received in October 1992 – February 1993 the position of peculiarity conti-

nuously changes from  $-260$  km/s to  $-350$  km/s and then decreases to  $-155$  km/s. This fact is very important for constructing of physical models of mass outflow. Preliminary estimation of the time of each type change is being during month or so, the duration of each stage is no less then four months. These variations may be regular and connect with light curve (Miroshnichenko et al. 1992). When VY Mon is seen as bright star ( $V \approx 13^m$ ) the P Cyg-type peculiarity is observed, and when VY Mon is seen as weak ( $V \approx 14^m - 15^m$ ) the profile has blue emission at first and then becomes the single. The whole cycle is as long as 3–3.5 yr. We have derived the systematic displace of the centre of the main emission for each type:  $+70$  km/s for P Cyg,  $+120$  km/s for the blue emission stage,  $+140$  km/s for the single profile, but variations of its intensity relatively to continuum are weak. All three types imply that high-velocity outflows can be important envelope components and can be explained with the same limited models of anisotropic stellar wind, where terminal velocity is changed.

The flat infrared spectrum of VY Mon may signify the thin accretion disks, it is suggested that accretion rates are in range of  $0.6 - 0.2 \cdot 10^{-5} M_{\odot}/\text{yr}$  (passive) and  $3.5 \cdot 10^{-5} M_{\odot}/\text{yr}$  for active (Casey and Harper 1990).

Coexistense of accretion and outflow at the same time can lead to the situation rather dramatic for interpretation.

### References

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