Our monitoring of RY Sgr in 2005-2007 confirmed that the radial velocity averaging by the pulsation period varies from year to year which has already been noted for 1970 and 1988. Averaged radial velocities were -27, -15, and -20 km/s in 2005, 2006 and 2007 respectively. We did not find a smooth transition from one value to the other during our 5 months observations. Radial velocity pulsates with two periods: 37.6 and 49 days. As a result, the amplitude of velocity pulsation is decreased from 32 km/s in 2005 to 21 km/s in 2007 (observations in 2007 are still not fully reduced).

Discussion

Our equipment does not give a profile of spectral lines but we assumed that existence of several branches, except multiperiodicity of pulsations, can be concerned with splitting of the spectral lines on two components. According to Lawson et al. [1990], these components have variable intensities and their ratio varies during the pulsation period. These authors divided the lines on excitation potentials and found that the lines with low potential have the higher amplitude of pulsation. They explained this by influence of the external layers of extended stellar atmosphere. More negative velocities also have the same external layers of atmosphere. They explained this by lower potentials in upper layers. Theoretic investigations by Fadeev [1982, 1984] also showed that the pulsations arising in the uppermost layers of pulsing star have larger amplitudes of pulsation and these pulses are negatively displaced relatively to the internal layers. Therefore one of possible explanations of several curves of radial velocity pulsations may be changes in the outer layers of pulsating star atmosphere during different seasons.

Variations of the outflow velocity of substance with height in stellar atmosphere.

The interpretation takes into account peculiarities of stars with R Crb type variability. They are low-massive objects (~7% of the mass of the Sun) in the sub-Eddington luminosity (can exceed 10^4 luminosities of the Sun) with intensive mass loss (~10^{-6} mass of the Sun per year). Mass loss occurs with velocity more than 200 km/s at a level of dust condensation and it should be nonzero at a level of pulsing photosphere of a star. The outflow velocity -23 km/s can be reached on a level of 4-5 radii of mass of the Sun) of the sub-Eddington luminosity (can exceed 10^4 luminosities of the Sun) with intensive mass loss (~10^{-6}

Summary

We confirmed a stability of the main period of pulsations of radial velocity, as it was noted by Lawson et al. [1991] Analyzing our data by the algorithm of Lafler-Kinman we found two periods in pulsations of radial velocity, 37.6° and ~49°. Lawson et al. [1991] did not find the second period though it was already known from the analysis of previous data. In the consecutive pulsations, the radial velocity curves could be displaced on -2.3 km/s relatively to the previous pulsations. This displacement are real as they exceed observation errors (~0.3-0.4 km/s). The observations of 2007 are still processed but it is already possible to say that data are consistent only with one branch and instrumental parameter of velocity has unusual characteristics. We plan to continue observations in 2008.

Conclusions

There are two periods in pulsations of radial velocity that can be explained by the seasonal changes in the curve of radial velocities. But the measurements of two values of velocity compels us to take into consideration the splitting of lines on two components in the spectrum of RY Sgr and admit the presence of two layers in the atmosphere of a star pulsating with different periods. From given interpretation follows that matter outflows from photosphere of RY Sgr with velocity up to 13-17 km/s.