N14a Global disk oscillations in Be stars: Effect of the Be-disk evolution

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B emission (Be) stars are early-type stars surrounded by gaseous equatorial disks from which the optical emission arises. Many Be stars show long-term V/R variation, which is variation of the ratio of the relative intensity of violet(V) and red(R) peak of their emission line profile. This variation is attributed to global one-armed oscillations in the equatorial disk. Previous studies of global oscillations in Be disks, for simplicity, assume a power-law density distribution of the disk. However, there are observational evidences of formation and dissipation of the disk in some Be stars. This causes long-term evolution of the disk density distribution. In the dissipation stage, especially, the disk will start to accrete from the innermost part of the disk causing a gap between the disk and the star, so the density distribution is far from power-law form.

In order to study the global disk oscillations with a more realistic disk models, in this study, we take into account the effect of Be disk evolution. We calculate the long-term density evolution of the disk in formation and dissipation stage. Then, using the obtained density distribution, we calculate one-armed eigen modes for several particular times in both stages. In the disk formation stage, we find that the oscillation frequency is higher in later times before the disk is fully developed. While in the dissipation stage, because the local precession frequency is higher than in formation stage, we find higher oscillation frequency. Thus, we expect that V/R periods become shorter as the innermost part of the disk start to accrete. We also study the global disk oscillations in binary Be star disks taking into account the tidal effects of the companion.