

DISSIPATION OF CIRCUMSTELLAR DISKS OF BE STARS

B. E. Sabogal¹, K. Y. Ubaque¹, A. García-Varela¹, M. Álvarez², and L. Salas²

Studies of L-band spectra of Be stars are useful to set constraints to the models of formation and evolution mechanisms of the circumstellar disks around these stars. Because few such studies have been performed, more of them are needed to confirm the characteristics reported about the optical depth and evolution of these disks. In this work, we studied new L-band spectra of 7 bright galactic Be stars that were obtained by using CID-InSb spectrograph at the 2.1-m telescope at OAN/UNAM San Pedro Martir Observatory, Baja California, Mexico. We used these data to locate these stars, and the Be stars previously studied in the IR, on a flux ratio diagram ($\log \frac{Hu_{14}}{P\gamma}$ vs $\log \frac{Hu_{14}}{Br_{\alpha}}$). We found that 28 Cyg has moved significantly along this diagram implying strong changes of its disk from optically thick to an optically thin one between 2001 and 2014. On the base of the absence of emission lines in the spectra, the circumstellar disks of θ CrB and 66 Oph have been almost totally dissipated. These three stars have decaying circumstellar disks. The other stars: γ Cas, ϕ Per, 28 Tau and o Her have optically thin disks, that have been almost stable in time. It will be important monitoring these and other Be stars in the L-band to observe the changes on their circumstellar disks, and to observe also in this band, the building-up stars, i.e. stars that create a new disk, or that change it from a very tenuous one to an optically thick circumstellar disk. Our spectra contribute to enlarge the infrared spectroscopic database of Be stars.

¹ Universidad de los Andes, Departamento de Física, Cra. 1 No. 18A-10, Edificio Ip, A.A. 4976, Bogotá, Colombia (bsabogal@uniandes.edu.co).

² Instituto de Astronomía, Universidad Nacional Autónoma de México, Ensenada, B.C., México.

PROPERTIES OF CIRCUMSTELLAR DISKS OF THREE NORTHERN GALACTIC BE STARS

K. Y. Ubaque Brito¹, B. E. Sabogal Martínez¹, A. García-Varela¹, L. Salas², and M. Álvarez²

Be stars have a very rapid rotation that leads, along with other mechanisms, to the generation of circumstellar decretion disks. Spectroscopic analysis of their Hydrogen emission lines in the infrared can be useful to understand the disk evolution. This is possible through characterizing the dependency with wavelength of physical parameters of the lines, such as integrated flux and full width at half maximum.

In this work, we obtained integrated fluxes for Humphreys, Pfund and Brackett spectral lines of a sample of 3 Be stars: γ Cas, ϕ Per and 28 Tau. With these data, we analyzed changes in optical depth and density of the disks. We found that the circumstellar disks of these stars are optically thin, based on a flux ratio diagram and from a qualitative description of the morphology found in the infrared spectra. We studied also the optical spectra of BeSS database of these stars and found that the variability of the H α profile is correlated with the evolution and stages of stability in Be star disks. In our case, we could say that γ Cas and ϕ Per have circumstellar disks stable with a high density, which have remained almost constant. By contrast the remarkable variability of H α profile for star 28 Tau lead us to believe that its disk has had episodes of dissipation and slight changes in density.

All these results are in agreement with previous studies for different Be stars, confirming the mentioned aspects as general indicators of density changes suffered by circumstellar disks of Be stars.

¹ Universidad de los Andes, Departamento de Física, Cra.1 No.18A-10, Edificio Ip, A.A.4976, Bogota, Colombia (ky.ubaque2479@uniandes.edu.co).

² Instituto de Astronomía, Universidad Nacional Autónoma de México, México.