Resolving the kinematics of the disks around Galactic B[e] supergiants

G. Maravelias (1,2), M. Kraus (2,3), L. S. Cidale (4,5,1), M. Borges Fernandes (6), M. L. Arias (4,5), M. CurÃ© (1), G. Vasilopoulos (7)

(1) Instituto de FÃ-sica y AstronomÃ-a, Universidad de ValparaÃ-so, Chile, (2) AstronomickÃ½ Ãºstav, Akademie vÄ›d ÄŒeskÃ© republiky, Czech Republic, (3) Observatory, University of Tartu, Estonia, (4) Instituto de AstrofÃ-sica de La Plata (CCT La Plata - CONICET, UNLP), Argentina, (5) Departamento de EspectroscopÃ-a, Universidad Nacional de La Plata, Argentina, (6) ObservatÃ³rio Nacional, Brazil, (7) Max-Planck-Institut fÃ¼r Extraterrestrische Physik, Germany

B[e] Supergiants are luminous evolved massive stars. The mass-loss during this phase creates a complex circumstellar environment with atomic, molecular, and dusty regions usually found in rings or disk-like structures. For a better comprehension of the mechanisms behind the formation of these rings, detailed knowledge about their structure and dynamics is essential. To address that, we obtained high-resolution optical and near-infrared spectra for 8 selected Galactic B[e] Supergiants, for which CO emission has been detected. Assuming Keplerian rotation for the disk, we combine the kinematics obtained from the CO bands in the near-IR with those obtained by fitting the forbidden emission [OI] Î»5577, [OI] Î»Î»6300,6363, and [CaII] Î»Î»7291,7323 lines in the optical to probe the disk structure. We find that the emission originates from multiple ring structures around all B[e] Supergiants, with each one of them displaying a unique combination of rings regardless of whether the object is part of a binary system. The confirmed binaries display spectroscopic variations of their line intensities and profiles as well as photometric variability, whereas the ring structures around the single stars are stable.

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Email: gmaravel@physics.uoc.gr