Model Infrared Spectra for Evolving Red Supergiants

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Abstract

The space and ground based infrared spectra of red supergiants are modeled and arranged in order of their evolutionary status with their theoretical model parameters. Because of their large amplitude pulsation, the observational data taken at different phases show wide discrepancies. The chemical compositions of the dust shells around red supergiants are affected by the nuclear reactions and dredge-up processes of the cental stars. Those processes are sensitively dependent on the initial mass, the initial chemical composition, and the evolutionary status. Miras, infrared carbon stars, and OH/IR stars have a close link in their evolution in many aspects, i.e. the chemical composition, the optical depths and the mass loss rates. The evolutionary tracks for the three classes of red supergiants on infrared two-color diagram have been constructed.