
Tracing physical processes affecting spectral formation in the low luminosity B[e] stars of the FS CMa group

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Abstract

We discuss specific phenomena influencing the spectral formation in the FS CMa stars, a collection of apparently related low luminosity B[e] stars. Despite their relatively small number (~70 members and candidates), this largely overlooked group presents a range of intriguing spectroscopic anomalies. In contrast to other B[e] stars and almost every known stellar group, the evolutionary status of FS CMa stars remains a puzzle. Progress requires constructing physically appropriate synthetic spectra. However, radiative transfer in the FS CMa stars is quite complicated. Strong redistribution of energy from UV to visual and IR results from the UV Fe II curtain, which is observed in, e.g., LBVs and classical novae but not in classical Be stars. The circumstellar medium is not static, and even the inferred outflows are variable. Accelerated and decelerated layers or structures have been observed. The observed flow velocities do not exceed several hundreds km/s, definitely ruling out employing any simplification, such as the Sobolev method. The radiative transfer has to be solved from dense to low-density environment including not only atomic properties, but also dust opacities. Last but certainly not least is a complication related to the structure of the circumstellar medium, which is neither symmetric nor homogeneous and shows large scale changes on time scale of months.

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