Studying the origin of SACs and DACs in the spectra of hot emission stars

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Absract

In the spectra of hot emission stars (Oe and Be stars) we observe the appearance of complex spectral line profiles, which are due to the existence of DACs and/or SACs phenomenon. In order to explain and reproduce theoretically these complex line profiles we use the GR model (Gauss-Rotation model). This model presupposes that the regions, where the spectral lines are created, consist of a number of independent and successive absorbing or emitting density regions of matter as the area that contains these spherical density regions is near the star and thus is limited. In this study we are testing a new approach of GR model, which supposes that the independent density regions are not successive. We use this new approach in order to study the density regions that produce the C IV, N V resonance lines of a number of Oe stars and the Mg II and Fe II resonance lines of a number of Be stars. Comparing the results of this method with the classical way of GR model that supposes successive regions we try to conclude to the best one in the case of hot emission stars.

A probabilistic approach for reconstruction of DAC's line components

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Absract

Spectral lines of many Oe and Be stars show Discrete Absorption Components (DACs). Disentangling the line components and identifying the physical mechanisms that produce them is a complex procedure, which is relying on many unknown parameters. The number of components that make up each line is one of the factors that need to be defined before examining the physical procedure producing the line profile. The problem of the exact number of the line components is addressed by means of a new stochastic method developed in literature. More specific, each DAC is treated as a random signal which is considered as a superposition of independent signals. The number of independent signals is the number of the interfered lines that make up the DAC. It is demonstrated that this number coincides with the number of distinct serrations in the corresponding correlation function of the initial signal.