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Program and Abstracts

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A NEW APPROACH FOR THE STRUCTURE OF Hα REGIONS IN 120 Be STARS

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The spectra of a fraction of Oe and Be stars have Discrete Absorption Components (DACs) or Satellite Absorption Components (SACs) which create complex line profiles of these stars. The shapes of these lines are interpreted by the existence of two or more independent layers of matter nearby a star. These structures are responsible for the formation of a series of satellite components for each spectral line. First, here we will shortly present a model reproducing the complex profile of the spectral lines of Oe and Be stars with DACs and SACs (Danezis et al. 2003, Lyratzi & Danezis 2004). In general, this model has a line function for the complex structure of the spectral lines with DACs or SACs and include a function L that considers the kinematic (geometry) of an independent region. We have developed the model considering random velocities in the calculation of the function L. With this modification, the model can explain the complex structure of all line forming independent regions, until the regions where the Mg II lines are created. However, with this model it is not possible to explain the structure of the Hα forming region, i.e. the model cannot appropriate fit the complex Hα line profiles of Be stars. Here we will present a new approach of the model which is able to explain the complex structure of Hα regions. The new approach of the model is based on a synthesis of Hα lines using the fact that sub-regions have random, radial and rotation velocities, but also that some atomic (collisional) processes can contribute to the line wings (it brings a Voigt profile). Moreover, we study Hα lines of a sample of 120 Be stars and we obtained the radial and rotational velocities of the independent regions in which the satellite components are created. Finally, we calculate the optical depth (τ) and the column density (d) of each independent density region and we discuss the correlations between obtained parameters of sub-regions in the sample.

References

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