Study of intensity spectra

from rapidly rotating stars

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Talk abstract

The standard technique to model rotating stars takes a 1-D approach. This kind of models assumes that the star's geometry is close to the spherical one. But for fast rotators, the centrifugal force flattens the star and its shape may strongly deviate from that of a sphere. This shape generates a latitudinally dependent effective temperature T_{eff} and surface effective gravity g. Thus, these profiles will affect the observed spectra according to the inclination i of the rotation axis on the line of sight.

In our work we develop a new approach based on the combination of recent two-dimensional ESTER model, which provides the latitudinal dependence of T_{eff} and $logg$, and PHOENIX models which, for given T_{eff} and $logg$, determine the specific intensities according to the direction. Thanks to these hybrid models we show that we can use them to compute theoretical photometric quantities, which can be used to invert observed data and determine the following three fundamental parameters: the polar effective temperature, the centrifugal flattening and the inclination i. Our resolution scheme is tested on Vega.