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Room:303

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Study of differential rotation in rapidly rotating stars in mean field model

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We investigate the internal differential rotation in rapidly rotating stars in an axisymmetric mean field model. The background of this study is the suggestion that the sun rotated faster than now in its younger age. The differential rotation is an important factor for the stellar magnetic field, since the shear of the flow bends the magnetic field and gives energy to magnetic field, i.e. dynamo. We are interested in the morphology of the differential rotation in rapidly rotating stars. We use the model which succeeds in reproducing the solar differential rotation with an adequate latitudinal entropy gradient. Our result is: In the rapidly rotating stars, the meridional flow is not so fast that the latitudinal entropy gradient generated by the meridional flow is not large enough to push the differential rotation far from the Taylor-Proudman state where the contour lines of the angular velocity are parallel to the rotational axis.

Keywords: Sun, Differential rotation, Star, Magnetic activity