

Slowly rotating stars: deriving the Hartle model from first principles.

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ABSTRACT

The Hartle model describes slowly rigidly rotating stars in the strong field regime by using perturbation theory up to second order. The model involves a number of hypotheses, particularly regarding the structure of the fields when expanded in spherical harmonics that need justification. In this talk I present work in collaboration with Reina and Vera where the Hartle model is derived from first principles. Our results prove in particular that, at this level of approximation, the spacetime must be equatorially symmetric and is fully determined by two parameters, namely the central pressure and the rotation parameter of the fluid.