
Gravito-inertial modes at the surface of fast rotating stars

Michel Rieutord*¹

¹Institut de recherche en Astronomie et Planetologie (IRAP) – CNRS,, Université de Toulouse – 14 avenue Edouard Belin; 31400 Toulouse, France

Abstract

The recent discovery of gravito-inertial modes on the surface of Altair (alpha Aql) by Rieutord et al. (2023) (A&A 669, A99), using high-resolution spectroscopy, intriguingly presents the opportunity to investigate the surface layers of rapidly rotating stars. We shall first show that such waves are also detected on Rasalhague (alpha Oph), another fast rotator older and of higher mass than Altair.

This detection opens a new window on fast rotating star, in particular on the sub-surface layers where the kappa mechanism is presumably at work. Using two-dimensional ESTER models (Espinosa Lara & Rieutord 2013) combined with two-dimensional computations of eigenmodes with the TOP code (Reese et al. 2021), we show how these waves probe the thin convective layers and the sub-surface differential rotation (driven by the baroclinic torque) of rapidly rotating A-Type stars and can lead to new constraints on the physics of these stars and surface boundary conditions that should be applied.

*Speaker