
Rosette modes of oscillations in rotating stars as a new aspect of rotation-pulsation interaction

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Abstract

Recently, a new class of pulsation modes has been discovered in rotating stars in numerical computation by Ballot et al.(2012). The modes have frequencies in the range of gravity modes, but still outside the inertial domain, which implies that the amplitude of eigenmodes is not necessarily confined to the equatorial region. They are called rosette modes, because the structure of their eigenfunctions shows unique rosette patterns on the meridional plane. The physical mechanism of rosette-mode formation has been identified as interaction caused by the Coriolis force among eigenmodes with almost the same frequency (Takata & Saio 2013; Saio & Takata 2014). Regarding the effect of the Coriolis force as a small perturbation, the formation process can precisely be described by quasi-degenerate perturbation theory.

After summarising the properties of rosette modes, we discuss in this presentation the possibility of their detection in real stars and their effects on angular momentum transport in the stellar interior.

Ballot, J. et al., 2012, ASP Conf. Ser., 462, 398

Saio, H. & Takata, M., 2014, PASJ, in press

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