# Gravito-inertial waves in a differentially rotating spherical shell

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**Abstract**

While many pulsating stars have been measured with high angular velocities, the properties of the detected modes are still badly-known. These modes obey a partial differential equation of mixed type.

We aim at improving our understanding of such modes by considering their propagation in a stably stratified spherical shell when the differential rotation due to baroclinicity is consistently taken into account. Rotation and stratification define the bounds of the hyperbolic domain where waves can propagate.

We use high-resolution numerical simulations and semi-analytical calculations to investigate the domains in which the modes exist, and the circumstances under which they focus on singular structures, namely attractors. We establish that these attractors still exist for differentially-rotating stably stratified configurations, and study the strength of their focusing in the parameter space.

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