

Internal shear layers in a stratified and rotating fluid

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In a stratified and rotating fluid, internal shear layers are systematically generated when an object oscillates at a frequency between the buoyancy frequency and the vorticity of the fluid. In this talk, I first show that these viscous layers have a generic self-similar structure in the limit of large Reynolds numbers¹. Then, I consider the reflection of these layers on a boundary. I show that a strong meanflow correction is generated close to the reflection point. I provide its asymptotic structure in the limit of large Reynolds numbers according to the boundary inclination. I finally discuss applications of the results in the context of oceanography (tide) and planetary interiors (libration).

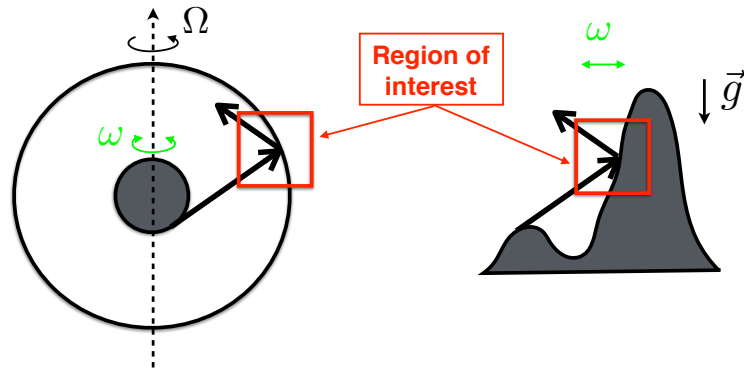


Figure 1: Sketches of the typical applications. Left: Reflection on the outer boundary of a wave beam generated by the libration of the inner core; Right: Reflection on a mountain of a wave beam generated by a tidal wave on a supercritical topography.

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¹Le Dizès & Le Bars, *J. Fluid Mech.* **826**, 653 (2017).