



Experimental Study of Internal-Tide Scattering by 2D Topography

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Scattering of internal tides is an important mechanism to understand energy transfer in the ocean. Numerical [1] and oceanographic [2] studies have shown that topography can be responsible for conversion from low to high modes, thereby transferring energy from larger to smaller scales.

To understand and quantify more precisely low-to-high mode scattering by topography, we performed a series of experiments in which we generated a mode-1 internal tide using a new configuration for the wavemaker recently developed by Gostiaux *et al.* [3]. The experiments used PIV to visualize the wave field and took place on the Coriolis Turntable in Grenoble (France). We first studied the free evolution of the internal tide, in order to check its monochromaticity and vertical structure. Thereafter, we analyzed the interaction of the internal tide with idealized 2D topographies (knife-edge, gaussian bump) using modal decomposition techniques.

[1] T. M. S Johnston & M. A. Merrifield, *Internal Tide Scattering at the Line Islands Ridge*, J. Geophys. Res. (2003), **108**:3180.

[2] R. D. Ray & G. T. Mitchum, *Surface Manifestation of Internal Tides in the Deep Ocean: Observations from Altimetry and Island Gauges*, Prog. Ocean. (1997), **40**:135–162.

[3] L. Gostiaux, H. Didelle, S. Mercier & T. Dauxois, *A Novel Internal Waves Generator*, Exp. in Fluids (2007), **42**:123–130.