Abstract Submitted
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Experimental study of 3D internal gravity wave turbulence in the Coriolis facility[1] CLEMENT SAVARO, ANTOINE CAMPAGNE, THOMAS VALRAN, SAMUEL VIBOUD, JOEL SOMMERIA, NICOLAS MORDANT, Laboratoire des Ecoulements Geophysiques et Industriels, ECOULEMENTS DIPHASIQUES ET TURBULENCES TEAM — In geophysical flows energy can be transported by internal gravity waves that contribute also to a large amount of energy dissipation and mixing. When continuously excited by external forces like wind, currents or tides and coupled by nonlinearity they can develop a state of wave turbulence. The weak turbulence theory (WTT) can predict the stationary spectra of many waves systems but it application to internal waves remains questionable [2]. We build an experiment to study internal waves turbulence in 3D. Inside the 13 m-diameter tank of the Coriolis facility, four 6 m-long wall are set to form a 6X6X1 m^3 square box. The box is filled with a stable linear stratification of salt water. This stratification allows internal waves to be generated from two adjacent walls that can oscillate independently around their horizontal axis at a frequency slightly modulated in a narrow band. We performed time and space resolved PIV measurements. Spatio-temporal analysis of the PIV measurements confirm that internal waves are generated by non-linearity even far from the forcing frequencies. Discrete modes due to finite size effect are observed as well as a continuum of modes.

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[2]Y V Lvov et al., **J. Phys. Oceanogr.** 42(5):669, 2012

Clement Savaro
Laboratoire des Ecoulements Geophysiques et Industriels

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