Abstract Submitted
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Wave localization of linear gravity waves in shallow water: Global measurements and agreement between random matrix theory and experiments[1] ANDREA SCHMESSANE, Departamento de Fisica FCFM Universidad de chile, LABORATORY OF MATTER OUT EQUILIBRIUM TEAM[2] — Wave localization explains how a perturbation is trapped by the randomness present in a propagation medium. As it propagates, the localized wave amplitude decreases strongly by multiple internal reflections with randomly positioned scatterers, effectively trapping the perturbation inside the random region. The characteristic length where a localized wave is propagated before being extinguish by randomness is called localization length. We carried experiments in a quasi-onedimensional channel with random bottom in a shallow water regime for surface gravity water waves, using a Perfilometry Fourier Transform method, which enables us to obtain global surface measurements. We discuss keys aspects of the control of variables, the experimental setup and the implementation of the measurement method. Thus, we can control, measure and evaluate fundamental variables present in the localization phenomenon such as the type of randomness, scattering intensity and sample length, which allows us to characterize wave localization. We use the scattering matrix method to compare the experimental measurements with theoretical and numerical predictions, using the Lyapunov exponent of the scattering matrix, and discuss their agreement.

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