

Experiments on Internal Waves: Propagation and Reflection

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ABSTRACT: To understand how internal waves reflect off sloping topography such as the continental shelf, we performed a series of laboratory experiments to study the energy flux of propagating and reflecting internal waves in a continuously stratified salt water fluid. The internal waves are generated by a wave generator that is capable of producing monochromatic, vertically trapped waves. These internal waves propagate along the length of the tank (5m) and reflect. The structure and amplitude of the internal waves are measured using a technique called synthetic schlieren that also enables us to measure the energy in the wave. We examine how the vertical displacement amplitude and energy flux change as we change the frequency of the wave generator and the stratification of the fluid. Using Hilbert transform we have separated the waves traveling right to the waves traveling left enabling us to understand how much energy from the incoming waves is present in the reflected internal waves. The analysis of the energy flux of the internal waves during propagation and reflection using the Hilbert transform is helpful as it brings insight into phenomena that are difficult to observe during field studies.

ALL ARE WELCOME!!!