

Abstract Submitted
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Interference of Locally Forced Internal Waves in Non-Uniform Stratifications ROHIT SUPEKAR, THOMAS PEACOCK, MIT — Several studies have investigated the effect of constructive or destructive interference on the transmission of internal waves propagating through non-uniform stratifications. Such studies have been performed for internal waves that are spatiotemporally harmonic. To understand the effect of localization, we perform a theoretical and experimental study of the transmission of two-dimensional internal waves that are generated by a spatiotemporally localized boundary forcing. This is done by considering an idealized problem and applying a weakly viscous semi-analytic linear model. Parametric studies using this model show that localization leads to the disappearance of transmission peaks and troughs that would otherwise be present for a harmonic forcing. Laboratory experiments that we perform provide a clear indication of this physical effect. Based on the group velocity and angle of propagation of the internal waves, a practical criteria that assesses when the transmission peaks or troughs are evident, is obtained. It is found that there is a significant difference in the predicted energy transfer due to a harmonic and non-harmonic forcing which has direct implications to various physical forcings such as a storm over the ocean.

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