

Abstract Submitted
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Excitation of harmonic modes by an internal wave beam incident on a simulated ocean pycnocline¹ SCOTT WUNSCH, ALAN BRANDT, Johns Hopkins University — Laboratory experiments have been performed to investigate the reflection of an internal wave beam with a “pycnocline” layer situated below an unstratified layer in order to simulate observed oceanic processes. An oscillating cylinder was used to generate internal wave beams in the well-known “St. Andrew’s Cross” pattern. Interactions with the pycnocline were observed using the synthetic schlieren technique. As the beam refracted into the pycnocline, a discrete spectrum of harmonic modes was excited. For modest pycnocline stratifications (relative to the stratified layer below) only a few modes were observed, containing only a few percent of the kinetic energy of the primary beam. However, strongly stratified pycnoclines resulted in many excited modes and a more significant transfer of energy. The observed nonlinear energy transfer may be indicative of the validity of a postulated mechanism for the formation of oceanic internal solitary waves by internal waves incident on the pycnocline.

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