

Abstract Submitted
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A model for the generation of solitary waves by reflections of tidal wave beams at the ocean thermocline¹ T.R. AKYLAS, MIT, ROGER GRIMSHAW, Loughborough U. — There is evidence from field observations that, apart from direct forcing by ocean-floor topography, internal solitary waves can also arise from the interaction with the ocean thermocline of tidal internal wave beams. A theoretical model is presented in support of this generation mechanism. The thermocline is modelled as a sharp interface between a shallow homogeneous layer on top of a deep weakly stratified fluid. A propagating internal wave beam in the lower fluid impinging on the interface generates a reflected wave beam as well as a weakly dispersive interfacial disturbance, which evolves into a series of solitary waves if nonlinear wave steepening is strong enough to overcome radiation damping into the lower fluid. Sample numerical results reveal that this mechanism is robust and can play an important part in the field.

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