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Effect of pycnocline thickness on internal wave bolus transport<sup>1</sup> MICHAEL ALLSHOUSE<sup>2</sup>, Department of Mechanical and Industrial Engineering, Northeastern University, HARRY SWINNEY, Department of Physics, University of Texas at Austin — Internal waves shoaling on a continental slope can produce boluses, which are vortices that develop and travel upslope with the shoaling internal wave. In contrast to propagating solitary waves, boluses can trap and transport nutrient rich water upslope. Past laboratory investigations of bolus generation and transport have examined systems that have two layers of uniform density. The present laboratory experiment examines bolus formation and transport as a function of the thickness of a model pynchocline where there is a continuous variation in density between two regions of constant density. Our dye based measurements for transition layers varying in thickness from 2 to 30 cm demonstrate that fluid transport by boluses exhibits a maximum as the thickness of the transition layer is varied. Complementary Navier-Stokes direct numerical simulations, analyzed using Lagrangian coherent structure techniques, compare well with the laboratory observations.

<sup>1</sup>ONR MURI Grant No. N000141110701 <sup>2</sup>Department of Physics, University of Texas at Austin

> Michael Allshouse Department of Mechanical and Industrial Engineering, Northeastern University

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