

Abstract Submitted
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Gravity currents in two-layer stratified media A.W. TAN, M.R. FLYNN, University of Alberta, Canada — An investigation of gravity currents propagating through a two-layer stratified ambient of finite vertical extent is presented. Our theoretical discussion considers slumping, supercritical gravity currents, i.e. those that generate an interfacial disturbance whose speed of propagation matches the front speed. In contrast to previous studies, we parameterize the amplitude of the interfacial disturbance; the accuracy of this approach is confirmed by comparison against experimental and numerical data. Measured front speeds show positive agreement with analogue model predictions, which remain strictly single-valued. The front speed is essentially independent of the interfacial thickness, δ , even in the limiting case where $\delta = H$ so that the environment is comprised of a uniformly stratified ambient with no readily discernible upper or lower ambient layer. Our experiments also consider the horizontal distance, X , at which the front begins to decelerate revealing a non-monotonic dependence on the ambient interface height.

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