

Abstract Submitted
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Vorticity models for gravity currents propagating into two-layer stratified ambients MOHAMMAD AMIN KHODKAR, PhD student, MOHAMAD NASR-AZADANI, Postdoctoral student, ECKART MEIBURG, Professor — We investigate the propagation of Boussinesq gravity currents into two-layer stratified ambients by means of vorticity models and two-dimensional Navier-Stokes simulations. The control volume-based vorticity model enforces the conservation of vertical momentum by balancing the in- and outflow of vorticity with the baroclinic vorticity generation inside the control volume. In this way, it avoids the need for energy-based closure assumptions, such as those invoked in earlier modeling efforts. We find that for flow fields both with and without upstream propagating bores, the model predictions regarding the gravity current and bore velocities are in good agreement with the simulation results.

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