

Abstract Submitted
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Dynamic Exact Solutions For Stratified Wall Shear Flows¹

GEORGE HARABIN, ROBERTO CAMASSA, TYLER KRESS, GRACE MCLAUGHLIN, RICHARD MCLAUGHLIN, UNC Chapel Hill, UNC JOINT FLUIDS LAB TEAM — An exact time dependent shear flow solution to the full Navier-Stokes equations under the Boussinesq approximation coupled to the advection-diffusion equation for density is investigated in semi-infinite domains with sloped wall boundaries. This solution extends the static solution found by O.M. Phillips in 1969 to include oscillatory time evolution. Long time asymptotics based on the analysis of the branch cut structures in the transform domain are derived and analyzed. Comparisons with preliminary experiments will be discussed.

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