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Filling box stratification fed by a gravity current CHARLIE HOGG, HERBERT HUPPERT, Institute of Theoretical Geophysics, University of Cambridge, JORG IMBERGER, Centre for Water Research, University of Western Australia — Fluids in confined basins can be stratified by the filling box mechanism. The source of dense fluid in geophysical applications, such as a cold river entering a warmer lake, can be a gravity current running over a shallow slope. Filling box models are often, however, based on the dynamics of vertically falling, unconfined, plumes which entrain fluid by a different mechanism to gravity currents on shallow slopes. Laboratory tank experiments of a filling box fed by a gravity current running over a shallow slope were carried out using a dye attenuation technique to investigate the development of the stratification of the ambient. These results demonstrate the differences in the stratification generated by a gravity current compared to that generated by a plume and demonstrate the nature of entrainment into gravity currents on shallow slopes.

Charlie Hogg
Institute of Theoretical Geophysics

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