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Mixing and entrainment of oceanic overflows: Implications for global climate evolution ROBERT ECKE, JUN CHEN, PHILIPPE ODIER[1], MICHAEL RIVERA, Los Alamos National Laboratory — Oceanic overflows are important elements of the Earth's global thermohaline circulation but the mixing and entrainment that occur for such overflows is poorly understood. In particular, as overflow water moves down an inclined slope its stability is governed by the competition between stratification, which stabilizes the flow, and vertical shear, which tends to destabilize the flow. The properties of our laboratory experiment are designed to mimic oceanic overflows to the extent achievable on laboratory-accessible length scales. The flow exits a nozzle and flows along an inclined plane such that there is gravitational forcing of the flowing gravity current. Velocity and density fields are measured simultaneous using particle image velocimetry and planar laser induced fluorescence. The flow structure and dynamics of mixing at different downstream locations are investigated for a different levels of stratification and shear. The role of turbulence is examined by comparing cases of turbulent and laminar gravity currents. The implication of these results for ocean simulations and for understanding global climate are discussed.

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