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Characterization of turbulent mixing in an Oceanic Overflow Facility PHILIPPE ODIER, JUN CHEN, MICHAEL RIVERA, ROBERT ECKE, Los Alamos National Laboratory — The mixing and entrainment process in oceanic overflows, e.g. Denmark Strait overflow (DSO), affects the global thermohaline circulation. Due to limited spatial resolution in global climate prediction simulations, the small-scale dynamics of oceanic mixing must be properly modeled. A laboratory Oceanic Overflow Facility is used to investigate the fine structure of the entrainment and mixing. Inside a water tank, lighter, turbulent fluid with Taylor Reynolds number R(lambda)=150 is introduced along an inclined plate into a denser environment. Simultaneous PIV and PLIF measurements are conducted to visualize and quantify the flow structure. The data are used to characterize the turbulent mixing. Eddy diffusivities are measured for the transport of momentum and buoyancy. A mixing length model is applied, yielding an estimate of the mixing length in the flow, for various values of the gradient Richardson number. The results are compared to the values measured in the ocean and to the values used in climate models.

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