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**Instability of Stratified Shear Flow: Intermittency and Length Scales** ROBERT ECKE, Los Alamos National Laboratory, PHILIPPE ODIER, ENS Lyon — The stability of stratified shear flows which occur in oceanic overflows, wind-driven thermoclines, and atmospheric inversion layers is governed by the Richardson Number $Ri$, a non-dimensional balance between stabilizing stratification and destabilizing shear. For a shear flow with velocity difference $U$, density difference $\Delta\rho$ and characteristic length $H$, one has $Ri = g(\Delta\rho/\rho)H/U^2$. A more precise definition is the gradient Richardson Number $Ri_g = N^2/S^2$ where the buoyancy frequency $N = \sqrt{(g/\rho)\partial\rho/\partial z}$, the mean strain $S = \partial U/\partial z$ with $z$ parallel to gravity and with ensemble or time averages defining the gradients. We explore the stability and mixing properties of a wall-bounded shear flow for $0.1 < Ri_g < 1$ using simultaneous measurements of density and velocity fields. The flow, confined from the top by a horizontal boundary, is a lighter alcohol-water mixture injected from a nozzle into quiescent heavier salt-water fluid. The injected flow is turbulent with Taylor Reynolds number about 75. We compare a set of length scales that characterize the mixing properties of our turbulent stratified shear flow including Thorpe Length $L_T$, Ozmidov Length $L_O$, and Ellison Length $L_E$.

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