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Efficient mixing in stratified flows: Rayleigh-Taylor instability within a stable stratification, experiments and computation MEGAN DAVIES WYKES, University of Cambridge, ANDREW LAWRIE, University of Bristol, STUART DALZIEL, University of Cambridge — When a Rayleigh-Taylor unstable interface is confined within an otherwise stable stratification the resulting mixing efficiency can be higher than 0.75. This process has been investigated through the use of laboratory experiments, computational numerics and a simple theoretical model. Boussinesq laboratory experiments will be presented, which examine three distinct initial stratifications. Computational experiments using an ILES code have also been performed. The mixing efficiency of laboratory and computational experiments agrees very well. A theoretical model, developed to predict the size of the turbulent mixing region that grows at the unstable interface, matches the results of laboratory experiments.

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