

Abstract Submitted
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Vortex Ring Induce Mixing: A Mixing Model JASON OLSTHOORN, STUART B. DALZIEL, Department of Applied Mathematics and Theoretical Physics — The parameterization of stratified turbulent mixing is key to developing large scale simulations of geophysical flows. Stratified mixing is often quantified through its mixing efficiency, a quantity that has been reported to vary significantly depending on the mixing mechanism. In the work presented here, we will investigate periodically-forced, externally-mixed stratified flows where the mixing mechanism is produced external to the mixing location. The mixing induced by vortex rings is a frequently studied phenomena as it is often compared with the eddies of fully developed turbulence. We continue this work experimentally with the aid of modern measurement techniques. Additionally, we have developed a one-dimensional model of vortex-ring-induced mixing and compare this model with both laboratory and numerical experiments. The results of the density field evolution, and the mixing efficiency, demonstrate a quantitative agreement between the model and experiments.

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