

Abstract Submitted
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Elementary vortex systems and the generation of internal waves

LAURA BRANDT, KEIKO NOMURA, University of California San Diego — As a first step toward improving our understanding of the behavior of a turbulent patch in a stratified fluid, we investigate the effects of stable stratification on different configurations of two-dimensional horizontally oriented vortices. The vortex systems considered, which consist of initially Lamb-Oseen vortices, include a single vortex, co-rotating vortex pair, counter-rotating vortex pair, two sets of co-rotating vortex pairs in a quadrupole configuration, and two sets of counter-rotating vortex pairs in a quadrupole configuration. Analytical and numerical methods are used to compute the linear and nonlinear interactions of the vortices and the generated internal waves, as well as the transport of vorticity and energy associated with each vortex configuration. These fundamental findings provide further insight on wave-vortex interactions and vortex structure decay.

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