Abstract Submitted
for the DFD14 Meeting of
The American Physical Society

Internal waves generated by unsteady impulsive forcing - numerical simulations[1] MATTHEW PAOLETTI, KARA SHIPLEY, ALAN BRANDT, Johns Hopkins University — Numerical simulations of the generation of internal waves by an unsteady impulse are presented. While extensive work has examined the generation of internal waves by steady flow, such as winds over mountains, or periodic flow, an example being tidal flow over bathymetry, internal waves can also be generated by transient events like those produced by local instabilities. The studies presented here focus on the generation of internal waves by the release of a patch of miscible fluid of constant density into a stably stratified water column. The fluid descends owing to its initial momentum, spreads in the lateral direction, and vertically displaces the isopycnals, leading to the generation of internal waves. The transfer of energy from the impulse to the internal wave field is characterized by the energy flux of the radiated internal waves. While the impulse is initially axisymmetric, the effects of the three-dimensional nature of the turbulent evolution are examined by comparing the results of two-dimensional and three-dimensional numerical simulations.

[1]Supported by the Office of Navel Research

Matthew Paoletti
Johns Hopkins University

Date submitted: 01 Aug 2014 Electronic form version 1.4