Abstract Submitted
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**Internal wave energy flux from density perturbations in nonlinear stratifications**[1] FRANK M. LEE, The University of Texas at Austin, MICHAEL R. ALLSHOUSE, Northeastern University, Boston, MA, HARRY L. SWINNEY, P. J. MORRISON, The University of Texas at Austin — Tidal flow over the topography at the bottom of the ocean, whose density varies with depth, generates internal gravity waves that have a significant impact on the energy budget of the ocean. Thus, understanding the energy flux ($J = p\,v$) is important, but it is difficult to measure simultaneously the pressure and velocity perturbation fields, $p$ and $v$. In a previous work, a Green's-function-based method was developed to calculate the instantaneous $p$ , $v$, and thus $J$, given a density perturbation field for a constant buoyancy frequency $N$. Here we extend the previous analytic Green's function work to include nonuniform $N$ profiles, namely the tanh-shaped and linear cases, because background density stratifications that occur in the ocean and some experiments are nonlinear. In addition, we present a finite-difference method for the general case where $N$ has an arbitrary profile. Each method is validated against numerical simulations. The methods we present can be applied to measured density perturbation data by using our MATLAB graphical user interface EnergyFlux.

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