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Resonant boundary currents fromtidal flow over topography need not generate intense internal waves[1] HARRY SWINNEY, A. DETTNER, M.S. PAOLETTI, University of Texas at Austin — The relationship between boundary currents generated by tidal flow over topography and the radiated internal wave power is examined in two-dimensional numerical simulations for a uniformly stratified fluid. The radiated power and the kinetic energy density of the boundary currents are computed as a function of the internal wave slope and the criticality parameter (ratio of the maximum topographic slope to the internal wave slope). We consider cases where the hydrostatic approximation is valid as well as test theoretical predictions for models of the deep ocean where the beam slope diverges and thus the hydrostatic approximation fails. We confirm that resonant boundary currents with large kinetic energy densities form over critical topography. However, this resonance phenomenon does not extend to the power radiated by the internal waves that propagate away from the topography. The conclusion is that the kinetic energy density in the boundary currents cannot be used as a proxy to characterize the conversion of tidal energy to radiated internal wave power.

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