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Internal wave generation by tidal flow over random topography JIAJUN ZHAO, LIKUN ZHANG, HARRY SWINNEY, University of Texas at Austin — The irregularity of oceanic topography plays a critical role in determining the power in internal waves generated by tidal flow over the seafloor. We conduct numerical simulations (for a fluid with a constant buoyancy frequency) for different synthetic random topographies. For topography with small rms height $H_{\rm rms}$ and small slopes the simulations yield a *quadratic* dependence of the power on $H_{\rm rms}$, in accord with linear theory. However, for tall topography with steep slopes the internal wave power is found to vary *linearly* with $H_{\rm rms}$. The transition from quadratic to linear scaling of the radiated internal wave power on $H_{\rm rms}$ occurs when the "valley slope" exceeds the internal wave slope. (The valley slope, to be defined in this talk, characterizes the maximum slope of topography between adjacent peaks.) The simulations also reveal that the radiated power saturates with increasing topographic resolution, as conjectured in previous studies. The present results should be helpful in improving estimates of the total internal wave power generated by the world's oceans.

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