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Generation of internal gravity waves by tidal flow over random oceanic topography[1] JIAJUN ZHAO, Natl Univ of Singapore, LIKUN ZHANG, HARRY SWINNEY, University of Texas at Austin — Internal waves (IWs) are gravity waves that propagate within density-stratified fluids such as the ocean, atmosphere, and protoplanetary disks. IWs generated by tidal flow over oceanic topography provide much of the energy needed to sustain vertical mixing, which plays a critical role in ocean circulation and global climate. Therefore, it is important to determine the amount of energy that is extracted from tidal flow over topography and radiated into IWs. We conduct 2D numerical simulations to determine the IW power generated by tidal flow over random topographies that have the seafloor spectrum. The power is found to saturate with increasing topographic roughness, and to scale linearly with the characteristic height of the topography. The linear dependence on the topographic height is, surprisingly, nearly independent of the value of the exponent characterizing the topographic spectrum. Our results should lead to improved predictions of the IW power generated by tidal flow over global ocean topography.

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