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Generation of internal waves and boundary currents by tidal flow over 2D topography[1] AMADEUS DETTNER, MATTHEW PAOLETTI, HARRY L. SWINNEY, University of Texas at Austin — The majority of internal wave energy in the ocean is produced by tidal flow over topography. Regions of critical topography, where the topographic slope is equal to the slope of the internal waves, is often believed to contribute most significantly to the radiated internal wave power. Here, we present 2D experimental and computational studies of internal wave generation by tidal flow over several types of topographic ridges. We vary the criticality parameter ϵ, which is the ratio of the topographic slope to the wave beam slope, by independently changing the tidal frequency, stratification and topographic slope, which allows us to study subcritical ($\epsilon < 1$), critical ($\epsilon = 1$), and supercritical topography ($\epsilon > 1$). As in prior work [Zhang et al., *Phys. Rev. Lett.* (2008)], we observe resonant boundary currents for $\epsilon = 1$. However, we find that the normalized radiated power monotonically increases with ϵ. We find that an appropriate normalization condition leads to a universal scaling of the radiated power as a function of ϵ.

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