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Generation of mode 2 internal waves by interaction of mode 1 waves with topography

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Oceanic Internal waves can be decomposed into an infinite set of modes, and the dominant internal mode 1 waves have been extensively investigated. Although mode 2 waves have been observed, they have not received comparable attention, especially the generation mechanisms. In this work, we examine the generation of mode 2 internal waves by the interaction of mode 1 waves with topography. We use a coupled linear long wave theory with mode coupling through topography, combined with evolution using a Korteweg-de Vries model, to predict the mode 2 wave amplitude, both in an ideal three-layer system and in realistic oceanic settings. We find that the mode 2 amplitude is quite sensitive to the topography slope.