
Experiments on topographies lacking tidal conversion

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Abstract

In a stratified sea, internal tides are supposedly generated when the tide passes over irregular topography. It has been shown that for any given frequency in the internal wave band there are an infinite number of exceptions to this rule of thumb. This 'stealth-like' property of the topography is due to a subtle annihilation of the internal waves generated during the surface tide's passage over the irregular bottom. We here demonstrate this in a lab-experiment. However, for any such topography, subsequently changing the surface tide's frequency does lead to tidal conversion. The upshot of this is that a tidal wave passing over an irregular bottom is for a substantial part trapped to this irregularity, and only partly converted into freely propagating internal tides.

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