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Subharmonic instability of locally confined internal wave beams[1]
HUSSAIN KARIMI, T.R. AKYLAS, MIT — Oceanic internal wave beams are central to tidal conversion—the transfer of tidal energy to internal waves by the interaction of the barotropic tide with sea-floor topography—a process believed to be important in deep-ocean mixing. There is evidence from recent experiments and numerical simulations that instability of internal wave beams is triggered by nonlinear interactions with fine-scale subharmonic disturbances. Motivated by these findings, we study analytically resonant triad interactions of a locally confined wave beam with small-amplitude, fine-scale, subharmonic disturbances for the purpose of discovering the conditions under which wave beams become unstable. A primary concern is to understand the dependence of the instability growth rates on beam amplitude and width. Furthermore, the effect of the Earth's rotation is investigated and possible resonant configurations are identified.

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