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Instabilities of finite-amplitude locally confined internal wave beams: theory and experiment[1] BOYU FAN, TRIANTAPHYLLOS AKYLAS, MIT — The instabilities of spatially monochromatic internal waves have been well-studied in the past decades, owing to their fundamental nature and relevance to geophysical processes. On the other hand, internal wave beams with locally confined spatial profile have only recently gained appreciation for their distinct properties and instability mechanisms. Such wave beams provide a more realistic setting for the study of internal wave instabilities in the ocean as they naturally arise, for instance, from the interaction of the barotropic tide with bottom topography. Owing to their additional complexity, internal wave beam instabilities have thus far been analyzed primarily in weakly nonlinear contexts, with the most famous being the parametric subharmonic instability. Here, we instead investigate the stability of finite-amplitude internal wave beams to two-dimensional perturbations using Floquet theory. We then compare these theoretical results with novel experimental observations.

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