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Stability of internal wave beams to three-dimensional modulations[1] T.R. AKYLAS, MIT, T. KATAOKA, Kobe University — The linear stability of uniform, plane internal wave beams with locally confined spatial profile, in a stratified fluid of constant buoyancy frequency, is discussed. The associated eigenvalue problem is solved asymptotically, assuming perturbations of long wavelength relative to the beam width. In this limit, instability is found only for oblique disturbances which vary in the along-beam and the horizontal transverse directions. Progressive beams, which transport energy in one direction and are directly relevant to internal tides, are unstable if the beam steepness exceeds a certain threshold value, whereas purely standing beams are unstable even at infinitesimal steepness. A distinguishing feature of this three-dimensional modulational instability is the generation of circulating horizontal mean flows at large distances from the vicinity of the beam.

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