Abstract Submitted
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Transient triadic instability of internal gravity wave a new track to turbulence in the lee of a topography[1] JEAN-MARC CHOMAZ, GATAN LERISSON, Laboratoire d'Hyfdrodynamique, LadHyX, CNRS-Ecole Polytechnique — Internal gravity waves in a continuously stratified fluid propagate energy away from the source and are particularly important to understand the ocean mixing. We study the stability of different gravity wave inhomogeneous in space through fully non-linear direct numerical simulation and linear global stability analysis and transient growth computation. In particular the steady flow over an arbitrary topography is computed using the selective frequency algorithm and the stability properties of the flow are analysed using the Arnoldi-Krylov technique applied to the direct linear equation to retrieve the global spectrum and to the direct-adjoint technique to optimize transient growth. We show that, both exponential and transient growths are linked to the triadic instability of the lee wave but correspond respectively to the large scale branch and the small scale branch also known as the parametric subharmonic instability. Interpretation of this surprising selection principle is proposed in term of the absolute and convective instability of the 2D periodic planar wave (see the presentation by G. Lerisson et al.)

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