Abstract Submitted
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**Impulse response of an internal gravity vawe and the absolute or convective nature of the triadic instability**[1] GAÉTAN LERISSON, JEAN-MARC CHOMAZ, LadHyX, Ecole Polytechnique, France, SABINE ORTIZ, ENSTA, France — Internal gravity waves propagate energy from the source and are important to understand the ocean mixing. We compute the 2D impulse response of a infinite internal wave by direct numerical simulation using an extremely extended computational domain with a resolution up to 16384 by 8192 and integration time (up to 300 Brunt Väisälä periode). Such extended domain and long time are necessary since the base flow is periodic in space and the impulse response has to converge on each ray onto the spatio-temporal Floquet mode. We observe the splitting of the impulse response into 3 different wave packets and show that each of them corresponds to a different branch of the triadic instability. Reanalysis of the triadic instability taking into account the detuning from the exact resonance allows us to show that the group velocity of each leading triads is the average of the group velocity of the two resonant waves. The small-scale wave packet then moves with the fluid where as the large scale mode has a group velocity comparable or larger than the base wave itself. We deduce from this impulse response the absolute and convective nature of each branch of the triadic instability and predict a selection of the instability mode strongly sensitive to the mean advection speed.

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