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Mixing by internal waves PHILIPPE ODIER, BAPTISTE BOURGET, SYLVAIN JOUBAUD, THIERRY DAUXOIS, Ecole Normale Superieure de Lyon — A key-ingredient in oceanic dynamics is the mixing between waters of different densities. Internal gravity waves, ubiquitous in the ocean, are expected to contribute to these mixing processes. We performed a preliminary experimental study of the mixing induced by a vertical mode-1 or mode-2 internal wave propagating in a linearly stratified fluid. We use a conductivity probe to follow the evolution with time of the density profile, while the wave is continuously generated in the fluid. We observe that a mixing layer is formed at the location of the velocity minima (maximum shear). By measuring the evolution with time of the local Brunt-Väisälä frequency in this region, we are able to derive a mixing velocity. We notice that this mixing velocity increases with the amplitude of the forcing, as expected. We also observe a strong increase of this velocity when the internal wave becomes unstable via a triad resonant interaction (Parametric Subharmonic Instability, see associated abstract by B. Bourget), resulting in the growth of two daughter waves of smaller wave length and frequency.

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