

# Parametric Subharmonic Instability and mixing of Stratified Fluids

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Internal waves are believed to be of primary importance as they affect ocean mixing and energy transport. Several processes can lead to the breaking of internal waves and they usually involve non linear interactions between waves. In this work, we study experimentally the Parametric Subharmonic Instability, which provides an efficient mechanism to transfer energy from large to smaller scales. It consists in the destabilization of a primary wave and the spontaneous emission of two secondary waves, of lower frequencies and different wave vectors. We observe that the instability displays a different behavior if the primary wave is a monochromatic vertical mode-1 or a plane wave. Moreover, using a time-frequency analysis, we are able to observe the time evolution of the secondary frequencies. Using a Hilbert transform method we measure the different wave vectors and compare with theoretical predictions. Then, using various techniques to characterize the amount of mixing taking place, we try to establish the role played by this instability in the mixing processes of stratified fluids.