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Non local resonances in weak turbulence of gravity-capillary water waves NICOLAS MORDANT, QUENTIN AUBOURG, LEGI, Universite Grenoble Alpes, France — We investigate experimentally the statistical properties of wave turbulence of surface waves on water. In the limit of weak non linearity an energy cascade in scale is predicted by the Weak Turbulence Theory. Energy transfers are predicted to occur among resonant waves. We use a Fourier Transform Profilometry technique that provides a 2D measurement of the water surface deformation that is resolved in time and scale. The principle is to project a pattern on the surface of water which diffuses light thanks to the addition of a Titanium oxyde powder. The pattern can then be inverted to provide the elevation of the water surface. Our wave tank is 70 cm long and we investigate waves that lie is the vicinity of the capillary-gravity crossover with frequencies between 1Hz and 100 Hz. We compute 3-wave correlations so that to study the non linear coupling and the energy transfers among resonant waves. We observe a 3-wave non linear coupling which is dominantly unidirectional and non local in scale: a low frequency gravity wave can be coupled to 2 high frequency capillary waves. We will also discuss the importance of approximate resonances in the wave coupling.

Nicolas Mordant
Univ Joseph Fourier

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