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Spatial statistics of capillary wave turbulence MICHAEL BERHANU, ERIC FALCON, MSC, Paris Diderot University — Wave turbulence concerns the study of the statistical properties of a set of numerous nonlinear interacting waves. The archetype of this phenomenon are waves on the surface of a fluid [1]. One of the challenge of wave turbulence is to reach a simultaneous 2D-space and time measurement of the wave amplitude that goes further than usual spatially localized ones. Recently, Herbert et al. [2] performs this measurement for gravity wave turbulence using an optical method (Fourier Transform Profilometry). Here, we used another optical technique (Diffusing Light Photography [3]) with a fast camera, to reach a better spatial resolution that allows us to investigate spatiotemporal statistics of capillary wave turbulence. Linear and nonlinear dispersion relations of capillary waves are obtained as well as the full spectrum of wave amplitude both in the k and omega spaces. Statistical properties are extracted and analyzed in order to test the validity of Weak Turbulence Theory. Moreover, as this technique is not limited to small amplitudes of surface deformation, we can observe appearance of small capillary waves on steep gravity waves, and to check the impact of this gravity to capillary conversion on the wave turbulence.
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