

Colloquium Talk

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Unstable wave packets propagating in finite and shallow water regimes

Wednesday, February 7, 2018

at 15:00 h

ESI, Boltzmann Lecture Hall

Abstract: It is known that modulation instability (MI) is a fundamental mechanism that is responsible for the occurrence of extreme waves in deep-water. Breathers, being exact deterministic models, have been proven to be very useful to investigate the wide range of MI hydrodynamics in laboratory environments beyond simple periodicity. On the other hand, several buoy and platform measurements around the globe confirmed the existence of rogue waves also in finite and even shallow water regimes. We present results of a recent laboratory study on the propagation of unstable wave packets over variable bottom bathymetries. The experimental study has been performed in unique water wave facilities installed at the Technical University of Berlin as well as at the Tainan Hydraulics Laboratory. We show that unstable wave packets may remain rogue beyond the dimensionless depth threshold of $kh=1.363$ and demonstrate how the nonlinear evolution at play evolves into a dispersive shock dynamics.

A. Constantin

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