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Università di Roma Tor Vergata
Dipartimento di Fisica

Seminar

12th November 2018 - h. 14.30

Sala Fisica della Materia (Dipartimento di Fisica)

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"Explosive ripple instability due to incipient wave breaking"

Abstract

We study small ripples developing on slopes of breaking waves in the surf zone. Using the concept of wave action as an adiabatic invariant, we derive an explicit asymptotic expression for the change of ripple steepness. Through this expression, nonlinear effects are described using the intrinsic frequency and intrinsic gravity along Lagrangian (material) trajectories on a free surface. We show that strong compression near the tip on the wave leads to an explosive ripple instability. This instability may play important role for understanding fragmentation and whitecapping at the surface of breaking waves. Analytical results are confirmed by numerical simulations using a potential theory model. This is a joint work with André Nachbin.

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