STATISTICAL PHYSICS SEMINAR

June 28th, 2017.
Wednesday, 11.00
ELTE TTK Northern Building 2.54

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Wave-topography interaction: linear yet nonlinear

In this talk, I will present the recent advancements of the exact Floquet theory for linear water waves over a periodic bed of arbitrary shape and amplitude. Gravity and capillary-gravity surface waves in one layer fluids, and interfacial/internal waves in two-layer fluids are all considered. The theory is valid for both non-resonant and Bragg resonant frequencies, though the latter are forbidden in unconfined open domains. Over a periodic bed, the free waves are either propagating or standing, and their waveforms are either spatially periodic or spatially modulating (quasi periodic), depending on the frequency. The waveform geometry becomes frequency-dependent and is affected by surface tension. Despite the linear dynamics of fluid motions, these waves have features that are reminiscent of nonlinear waveforms, e.g. the modulation in space-time, asymmetric wave profiles and protuberant wave crests. This is due to the non-uniformity in the oscillation intensity and can be explained by the generation of spatial harmonics in wave-topography interaction. Comparisons with experimental observations are shown. Various applications are discussed.

1117. Budapest, Pázmány Péter sétány 1/A (Északi tömb)
Room 2.54
http://glu.elte.hu/~statfiz/index.html