

STATISZTIKUS FIZIKA SZEMINÁRIUMOK

2019. október 30.
szerda, 11.00
ELTE TTK Északi Tömb 2.54

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Investigating viscous surface wave propagation modes in a finite depth fluid

In this seminar, we present the effect of viscosity on the propagation of free-surface waves in an incompressible viscous fluid layer of arbitrary depth. While we focus on the properties of linear surface waves in more detail, the dependency of the parameters will be discussed. In the linear case, we show that in shallow enough fluids, no surface waves can propagate. Even in any thicker fluid layers, propagation of very short and very long waves is forbidden. When wave propagation is possible, only a single propagating mode exists for any given horizontal wave number. According to the numerical results, there can be two types of non-propagating modes. One type is always present, and there exist still infinitely many of such modes at the same parameters. In contrast, there can be zero, one or two modes belonging to the other type. Another significant feature is that KdV-like equations. They describe propagating nonlinear viscous surface waves. Since viscosity gives rise to a new wavenumber that cannot be small at the same time as the original one, these equations may not exist.

1117. Budapest, Pázmány Péter sétány 1/A (Északi tömb)

2.54-es szoba

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