



## Wave propagation in bounded two-fluid system

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Also, a new nonlinear problem for propagation of wave trains along the interface of the two semi-infinite inviscid incompressible fluids when both the upper and the lower fluids are of finite-depth is solved on the basis of the method of multiple scale asymptotic expansions.

The structure of the wave-packets is analyzed and the results are compared with the similar results for the systems “half-space – half-space” and “layer - half-space” is carried out. The form of wave-packets and condition of the second harmonic resonance at the interface between the fluids are investigated. The conditions of wave packet propagation of the  $\cap$ -form and  $\cup$ -form are presented and characteristics of resonant region are found. It is shown that in the case of great thickness of lower layer the surface tension smooths wave picture of capillary-gravitational waves. At that, the resonance region can be narrowing and tends to tighten into a point.