

## Research of Amplitude-Frequency Characteristics of Nonlinear Oscillations of the Interface of Two-Layered Liquid

**Authors :** Win Ko Ko, A. N. Temnov

**Abstract :** The problem of nonlinear oscillations of a two-layer liquid completely filling a limited volume is considered. Using two basic asymmetric harmonics excited in two mutually perpendicular planes, ordinary differential equations of nonlinear oscillations of the interface of a two-layer liquid are investigated. In this paper, hydrodynamic coefficients of linear and nonlinear problems in integral relations were determined. As a result, the instability regions of forced oscillations of a two-layered liquid in a cylindrical tank occurring in the plane of action of the disturbing force are constructed, as well as the dynamic instability regions of the parametric resonance for different ratios of densities of the upper and lower liquids depending on the amplitudes of liquids from the excitations frequencies. Steady-state regimes of fluid motion were found in the regions of dynamic instability of the initial oscillation form. The Bubnov-Galerkin method is used to construct instability regions for approximate solution of nonlinear differential equations.

**Keywords :** nonlinear oscillations, two-layered liquid, instability region, hydrodynamic coefficients, resonance frequency

**Conference Title :** ICFDT 2020 : International Conference on Fluid Dynamics and Thermodynamics

**Conference Location :** London, United Kingdom

**Conference Dates :** January 20-21, 2020