
Faraday waves in a movable tank and their mechanical analog

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Novel experiments on horizontal vibrations of rectangular tank with water under condition of parametric excitation of first mode of gravity surface Faraday waves are presented. The measurements are compared with data on the parametric excitation of standing waves in the horizontally constrained rectangular tank. An analogy between the motion of the compound pendulum on a cart and liquid sloshing in rectangular tank having horizontal degree of freedom is used. The parametric oscillations of a pendulum and the pendulum on a cart under vertical oscillations of pendulum support are considered. Experimental data are compared with the existing theoretical model. In experiments the particular attention is paid to the case involving the pendulum on a cart. The model of coupled motion of the system is constructed and numerically studied. Results are compared with experimental data.

Keywords: *Faraday waves, physical pendulum on a cart, parametric resonance, resonance dependence.*

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