

Nonlinear Effects, Observed in the Process of the Liquid Flowing Out of the Vibrating Vessels: Theory, Experiment and Applications

I.I. Blekhman, **L.I. Blekhman**, L.A. Vaisberg, V.B. Vasilkov, K.S. Yakimova

Institute for Problems of Mechanical Engineering and Mekhanobr-Tekhnika Corp., Saint Petersburg, Russia

A general physical explanation and theoretical description of two nonlinear phenomena are proposed. The first of them, called vibro-jet effect consists in the fact that when a plate with conic holes vibrates in a fluid, slow flows of fluid appear in the direction of the narrowing of the holes. The second phenomenon – the vibrational injection of gas into the fluid, discovered quite recently, consists in the fact that gas is being sucked into the vessel with the fluid through the hole in its lower part of the vessel, vibrating in the gas. It contains the results of the experimental investigations and of possible applications to the processes of screening and flotation. The phenomenon of the vibrational injection is illustrated by a short movie

[View the extended summary](#)