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Study into Development of Turbulent Mixing at Gas-Liquid Interface with accelerations from 10^2 g_0 to 10^5 g_0

N.V. Nevmerzhitsky, E.A. Sotskov & M.V. Bliznetsov

RFNC-VNIIEF, Russia, Sarov
postmaster@gdd.vniief.ru

The paper presents the results of the experimental study into development of turbulent mixing arising in Rayleigh-Taylor instability at the interface of a liquid layer accelerated by compressed gas.

We used water as liquid and helium compressed to the pressures 1-400 atm as gas. In experiments we varied the value of liquid layer acceleration from $\approx 10^2 g_0$ to $\approx 10^5 g_0$ (g_0=9.81 m/s^2). The layer mixing was about 20 mm.

The following is obtained: when increasing acceleration of a liquid layer within the given range, the rate of gas front penetration into liquid is decreased approximately a factor of two. The authors connect this phenomenon with changing the turbulent mixing zone structure resulted from the increasing pressure and acceleration.