NUMERICAL AND EXPERIMENTAL STUDIES OF DEVELOPMENT OF 2D-PERTURBATIONS UNDER THE RAYLEIGH-TAYLOR INSTABILITY AND THEIR TRANSITION TO TURBULENCE

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The results of experimental and numerical studies of the growth of 2D deterministic perturbations under the Rayleigh-Taylor instability and the flow transition to the turbulent stage at the gas-liquid interface are presented. The experiments were conducted using a light-gas gun. The perturbations at a substance interface were produced by the gun fluctuations by means of a special device. The wave length of perturbations was varied from 5.4 to 8.8 mm, the amplitude – from 0.3 to 0.4 mm, the value of liquid layer acceleration – from 5.2 to 18.8 mm/ms^2. Water was used as a liquid, compressed air – as a gas. The experimental data on transition of perturbations to a turbulent stage were obtained. The numerical simulation on EGAK hydrocode accompanied the experiments. The criteria of instability transition to the turbulent mixing stage are suggested.