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Growth rate of mixing zone in a direct numerical simulation of Rayleigh-Taylor multimode instability development

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On the base of many 2D numerical simulations of Rayleigh-Taylor instability development, which have been performed in the framework of ISTC Project #1481, the approximate formula was suggested to describe a mixing zone width variation with time. The initial perturbation is a sum of different modes with wavelength and amplitude, which are defined by certain law, and a random phase. The proposed formula has an asymptotic, corresponding to a spike movement with a constant velocity. Contributions of different modes to a zone width is described by the weights, depending on time and simulating the destruction of a given spike due to Kelvin-Helmholtz instability (Zmitrenko et al.(1997)). Different models of mixing zone growth are discussed.

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References

Zmitrenko, N.V., Proncheva, N.G., Rozanov, V.B., 1997 The evolution model of a turbulent mixing layer; Preprint FIAN #65, Moscow.