compressibility effects ON the DEVELOPMENT of Rayleigh-Taylor instability in laser targets

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The importance of the development of different kinds of instabilities under the laser targets compression was discussed repeatedly in various works of Russian and foreign authors. However, this subject still has a lot of white spots due to the large number of factors that have to be considered and the influence of which is necessary to track. One of these factors is the compressibility of the materials involved in mixing, and its role in the perturbation growth.

It is regarded that in most cases for ICF tasks the influence of compressibility can be neglected [1-3], both at the stage of shell acceleration by the ablator and deceleration due to target collapse. Following the [4-6], it should be noted that the term "compressibility" may be understood in different ways. We will divide the compressibility in terms of equations of state (in the case of a perfect gas at various specific heats ratios) and in terms of influence of the hydrostatic equilibrium (the form of the initial profiles of density and pressure).

The question of interest is the influence of compressibility parameters of the ICF directly to the mixing of the materials with different densities. The authors of the proposed work investigate it by direct numerical simulation by the example of simple 3D formulations with single- and multi-mode initial perturbations of the contact boundary. Calculations were performed on the hybrid cluster K-100 of the Keldysh Institute of Applied Mathematics and ended up on the nonlinear stage of the perturbation development, which is important, because it is difficult to develop analytical theory for this time range.

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