

Results of Modeling of the Direct-Drive Targets Implosions under Laser with Total Energy up to 2 MJ Using Various Numerical Codes

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Various direct-drive targets intended to use on Russian laser facility, as well as on OMEGA facility and NIF (in the polar-direct-drive approach) in the laser energy range from 26 kJ to 2 MJ are analyzed in the work. The results of simulations of the implosion of considered targets in a spherically symmetric formulation according to various 1D-3D numerical codes available to the authors are compared between each other as well as with published data for the same targets. The dynamics of compression and burning fairly good agrees in all variants of calculations. The most significant contribution to the observed differences is made by variations in the description of the absorption of laser radiation and the use of different EOS, which directly affect the value of the Fermi adiabat and other quantities that are important for ignition, such as density and temperature in the central region. On the basis of the data obtained, it can be concluded that to reconcile numerical results with experimental data, it is necessary to take into account 2D and 3D effects associated with the development of various initial perturbations.

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