

Simulation of hydrodynamic parameters of heavy-ion fusion target

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Abstract

Heavy ion fusion is one of the ways of producing nuclear energy in which, target is directly compressed by heavy ion beams. Ion beams due to high efficiency, repetition rate, and high performance capability are more advantages than laser beams. The design of pulse shape and target layers are important parameters in calculating the gain value. In this paper, the target hydrodynamic parameters driven by bismuth ion beam with energy of 10 GeV and pulse duration of 21 ns are simulated with the finite-difference time-domain (FDTD) method. The calculated gain is 222 for a typical fuel pellet. Our simulation results are compared with the results of MEDUSA and DEIRA codes.

Keywords: heavy ion fusion, Pulse shape, gain, finite-difference time-domain

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