

The updated advance on inertial confinement fusion program in china

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The purpose of the inertial confinement fusion (ICF) program in China is to perform deuterium-tritium (DT) thermonuclear ignition and burning.

In this report, we present the operating laser facilities of SG-IIU and SG-IIIP with laser energy output of about tens kJ for 0.35 μ m wavelength and of SG-III with laser energy of \sim 200kJ, these facilities now are serving for target physics experiments.

We also discuss a novel hybrid-drive ignition target for ICF, in which the combination of the laser indirect drive and direct drive generates a higher plasma pressure that drives the spherical-symmetry implosion compression of a layered DT capsule inside a spherical hohlraum rather than the cylindrical hohlraum at NIF experiments and suppresses hydrodynamic instabilities during implosion dynamics. Numerical simulations showed that the ignition and burn can be performed in laser energy less than 2MJ with high gain, some relevant experiments have performed on SG-III.

In addition, we also discussed the updated high energy density physics involving warm dense matter property which is quite important for the calculation of equation of states and transport coefficients in ICF implosion dynamics.