

Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Critical requirements for ignition and burn of impact fast ignition

MASAKATSU MURAKAMI, HIDEO NAGATOMO, TOMOYUKI JOHZAKI, HIROSHI AZECHI, ILE, Osaka Univ. — Impact fast ignition (IFI) is a new scheme of inertial confinement fusion research as an alternative to the standard type of fast ignition using petawatt (PW) laser. Although IFI does not need PW laser, it is required to achieve a super-high velocity of the order of 1000 km/s to convert the kinetic energy into the thermal energy corresponding to 5-10 keV, that are enough to occur ignition of the fuel. To clarify the critical requirements of IFI, two-dimensional simulations have been conducted. As a result it has turned out that ignition can be attained at a velocity of 1500 km/s under some accompanied conditions. It is also important to achieve a high in-flight density of 2-3 g/cc, which is expected to undergo further compression due to the geometrical convergence and shock compression. We present a theoretical model to describe such a high compression under high Mach acceleration of the impactor shell.

Masakatsu Murakami
Institute of Laser Engineering, Osaka University

Date submitted: 17 Jul 2008

Electronic form version 1.4