Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Deuteron Beam Driven Fast Ignition of a Pre-Compressed Inertial Confinement Fusion (ICF) Target XIAOLING YANG, GEORGE MILEY, University of Illinois, KIRK FLIPPO, Los Alamos National Laboratory, HEINRICH HORA, The University of New South Wales — Fast Ignition (FI) is recognized as the most promising approach to achieving the high energy gain target performance needed for commercial inertial confinement fusion (ICF). Deuteron beams not only provide heating via linear energy transfer when slowing down, but can also provide extra ?bonus? fusion energy through reactions in the target. In view of the recent observation of ultra-high-density deuterium clusters, in addition to the extra energy gain expected from the deuterons, we estimate the impact of the added deposition energy from the deuteron beam to the target fuel based on calculations using a modified energy multiplication factor Fc. The deuteron beam energy deposition range and time are also calculated in order to estimate optimized deuteron initial energy. The aim of this study is to explore the potential advantages of a deuteron beam driven FI scheme for ICF. However, a much more comprehensive calculation is needed to realize a full 3D experimental design for maximum fusion gain.

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Date submitted: 16 Jul 2010 Electronic form version 1.4