Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Exploration of kinetic and multiple-ion-fluids effects in D$_3$He and T$_3$He gas-filled ICF implosions using multiple nuclear reaction histories

HONG SIO, HANS RINDERKNECHT, MICHAEL ROSENBERG, ALEX ZYLSTRA, FREDRICK SÉGUIN, MARIA GATU JOHNSON, CHIKANG LI, RICHARD PETRASSO, Massachusetts Institute of Technology, NELSON HOFFMAN, KRIGORY KAGAN, KIM MOLVIG, Los Alamos National Laboratory, PETER AMENDT, CLAUDIO BELLEI, SCOTT WILKS, Lawrence Livermore National Laboratory, CHRISTIAN STÖECKL, VLADIMIR GLEBOV, RICCARDO BETTI, THOMAS SANGSTER, JOSEPH KATZ, Laboratory for Laser Energetics — To explore kinetic and multi-ion-fluid effects in D$_3$He and T$_3$He gas-filled shock-driven implosions, multiple nuclear reaction histories were measured using the upgraded Particle Temporal Diagnostic (PTD) on OMEGA. For D$_3$He gas-filled implosions, the relative timing of the DD and D$_3$He reaction histories were measured with 20 ps precision. For T$_3$He gas-filled implosions (with 1-2% deuterium), the relative timing of the DT and D$_3$He reaction histories were measured with 10 ps precision. The observed differences between the reaction histories on these two OMEGA experiments are contrasted to 1-D single-ion hydro simulations for different gas-fill pressure and gas mixture. This work is supported in part by the U.S. DOE, LLNL, LLE, and NNSA SSGF.

Hong Sio
Massachusetts Institute of Technology

Date submitted: 10 Jul 2014

Electronic form version 1.4