Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Layered capsule implosions on the National Ignition Facility[1]
SIEGFRIED GLENZER, Lawrence Livermore National Laboratory, NIC TEAM —
Recent experiments on the National Ignition Facility have provided the hohlraum target and laser drive conditions suitable for compressing inertial confinement fusion capsules with cryogenic fuel layers. As the next step towards ignition, these experiments employ capsules with layered TH ice and trace amounts of D that generate $\sim 10^{14-15}$ 14 MeV (primary) neutrons. The modest neutron yield allows fielding a suite of x-ray and neutron diagnostics to study the assembly of thermonuclear fuel. In particular, x-ray imaging and radiography as well as neutron yield Y, and the fuel down scattered fraction dsf, are developed to measure dense fuel layers with rR $\gtrsim 1$ surrounding a hot spot of multi-keV temperatures. The comparison with a large 2D simulation data base will be used to investigate implosion performance. In particular, a good predictor of performance has been found to be ITFX=Ydsf^2. The goal of the experiments is to optimize performance by tuning implosion velocity, entropy, shape and mix before deployment of DT fuel for achieving ignition and fusion burn.

[1]This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

Siegfried Glenzer
Lawrence Livermore National Laboratory

Date submitted: 20 Jul 2010 Electronic form version 1.4