Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Layered DT Direct-Drive Implosion Performance Using Neutron Spectroscopy on OMEGA C.J. FORREST, V.YU. GLEBOV, V.N. GONCHAROV, S.X. HU, D.D. MEYERHOFER, P.B. RADHA, T.C. SANGSTER, C. STOECKL, Laboratory for Laser Energetics, U. of Rochester, J.A. FRENJE, M. GATU-JOHNSON, PSFC, MIT — The performance of recent cryogenic DT implosions on OMEGA vary significantly with changes in the adiabat and implosion velocity. At lower adiabats and high implosion velocities, the areal densities (ρR's) decrease to less than a third of 1-D predicted values. This observation may explain hydro instabilities that could potentially break up the shell in flight. A neutron time-of-flight detector and a magnetic recoil spectrometer are used to infer a fuel ρR by measuring the primary neutrons that elastically scatter off the dense deuterium and tritium. An additional nuclear diagnostic with different lines of sight will be used to correlate potential variations from the cold fuel shell instability. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944.

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Date submitted: 12 Jul 2013 Electronic form version 1.4