Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

**Magnetic Compression of Low Adiabat Liquid Deuterium Filled Cylindrical Liners to Gbar Pressures*** MATTHEW MARTIN, PATRICK KNAPP, DANIEL DOLAN, Sandia National Laboratories — We report on experiments where cylindrical beryllium liners filled with liquid deuterium were compressed to extreme pressure and density with current pulse shaping. ALEGRA MHD simulation, in conjunction with the BERTHA transmission line model of Z accelerator, was utilized to design a shaped current pulse that minimized both the stagnation adiabat of the liquid deuterium and the confining beryllium shell. In one set of experiments the pressure at stagnation is inferred to be $\sim$ 100 Mbar using penetrating radiography. A peak liner convergence ratio (initial radius over final radius) of 7.6 was measured resulting in an average deuterium density of 10 g/cm$^3$ and areal density of 0.45 g/cm$^2$. The stagnation shock propagating radially outward through the liner wall was directly measured with a strength of $\sim$ 120 Mbar. In a second set of experiments the liner was imploded to a peak convergence of 19 resulting in a density of 55 g/cm$^3$ and areal density of 0.5 g/cm$^2$. The pressure at stagnation in this experiment is estimated to be $\sim$ 2 Gbar. This platform enables the study of high-pressure, high-density, implosion deceleration, and stagnation dynamics at spatial scales that are readily diagnosable (radius $\sim$ 0.1mm - 0.4mm).

*Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

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Date submitted: 24 Jul 2015 Electronic form version 1.4