

Abstract Submitted
for the SHOCK19 Meeting of
The American Physical Society

Absolute measurement of the compression of deuterium along isentropes to multi-TPa pressures¹ P. M. CELLIERS, A. FERNANDEZ-PAELLA, Lawrence Livermore Natl Lab, S. BRYGOO, CEA/DAM Bruyeres-le-Chatel, France, D. SWIFT, S. J. ALI, S. W. HAAN, M. MILLOT, J. H. EGGERT, D. E. FRATANDUONO, Lawrence Livermore Natl Lab — Equation of state models for deuterium and other light elements have traditionally been tested experimentally along Hugoniot, primarily the principal Hugoniot. The compression path of DT fuel in inertial confinement fusion (ICF) follows isentropes to very high density, where little experimental data on the density compression exist. We are developing an experimental platform to compress deuterium along isentropes similar to the ICF paths using the National Ignition Facility. Our approach combines spherical geometry with multi-shock reverberation to achieve near isentropic compression to multi-TPa pressures. The sample volume is diagnosed with radiographic techniques. Our goal is to measure compression paths relevant to current ICF platforms. We will describe details of the approach and show preliminary compression data approaching 10 TPa.

¹This work was performed under the auspices of the U.S. Department of Energy by LLNL under contract DE-AC52-07NA27344.

Peter Celliers
Lawrence Livermore Natl Lab

Date submitted: 28 Feb 2019

Electronic form version 1.4