Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

Analysis of data from shockless compression experiments to multi-megabar pressure[1] JEAN-PAUL DAVIS, JUSTIN BROWN, RAYMOND LEMKE, MATTHEW MARTIN, MARCUS KNUDSON, Sandia National Laboratories — Quasi-isentropic, shockless ramp-wave experiments promise accurate equation-of-state (EOS) data in the solid phase at relatively low temperatures and multi-megabar pressures. In this range of pressure, isothermal diamond-anvil techniques have limited pressure accuracy due to reliance on theoretical EOS of calibration standards, thus accurate quasi-isentropic compression data would help immensely in constraining EOS models. Multi-megabar shockless compression experiments using the Z Machine at Sandia as a magnetic drive with stripline targets have been performed on a number of solids. New developments will be presented in the analysis of data from these experiments using the single-sample inverse Lagrangian approach, including topics such as 2-D and magneto-hydrodynamic (MHD) effects and uncertainty quantification. Results will be presented for selected metals, with comparisons to independently developed EOS.

[1]Sandia 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: 25 Feb 2013 Electronic form version 1.4