

Abstract Submitted
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Ultra-High Pressure Shock Compression at the Sandia Z Accelerator.¹ MARCUS KNUDSON, Sandia National Laboratories, R.W. LEMKE, M.P. DESJARLAIS, C. DEENEY — The Sandia Z accelerator is capable of producing >20 MA current pulses with ~200 ns rise-time into short circuit loads, generating intense magnetic fields within the anode-cathode gap. The resulting Lorentz force enables Z to be used very effectively in accelerating plates to ultra-high velocity. Experiments have been directed toward highly accurate dynamic material studies. In particular, emphasis has been placed on launching planar, solid density flyer plates to velocities exceeding 30 km/s for use in equation of state (EOS) studies at high-pressure. Velocities up to 34 km/s have been obtained with aluminum flyer plates several mm in lateral dimensions and a few hundred microns in thickness, enabling highly accurate Hugoniot measurements to multi-Mbar. Emphasis will be placed on predictive magneto-hydrodynamic modeling and EOS results obtained for aluminum and deuterium.

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