Abstract Submitted
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Isochoric heating and adiabatic expansion of WDM with intense relativistic electrons JOSH COLEMAN, J. COLGAN, N.B. RAMEY, T. SCHMIDT, H.L. ANDREWS, J.O. PERRY, Los Alamos Natl Lab, D.R. WELCH, Voss Scientific — A ˜100-ns-long electron bunch with an energy of 19.8 MeV and current of 1.7 kA has been used to isochorically heat thin foils of Cu or Ti to T_e >1 eV. Adiabatic expansion of these warm dense plasmas has been observed, which fits well with the analytical point source solution. After 100 ns of heating, the plasma expands and the opacity drops emitting Ti-I or Cu-I, which indicates the measured density ranges from 1-3 x 10^{17} cm^{-3}. Additional efforts are underway to model the hydrodynamic expansion and deploy several diagnostics to measure the WDM. These include a Bragg spectrometer for K-shell emission, a PDV probe for hydro disassembly time and an indirect measurement of the plasma pressure, and a single pass density diagnostic. Preliminary measurements will be presented which are critical for characterizing the warm dense phase and providing a map of the EOS across a density range of 10^{16} <n_e (cm^{-3}) <10^{23} This work was supported by the National Nuclear Security Administration of the U.S. Department of Energy under Contract No. DE-AC52-06NA25396.

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