Abstract Submitted
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EXAFS measurements of ramp-compressed iron at the National Ignition Facility (NIF)[1] F. COPPARI, A. G. KRYGIER, Y. PING, J. M. MCNANEY, G. E. KEMP, D. BRAUN, D. B. THORN, M. MILLOT, P. C. CELLIERS, O. LANDEN, M. B. SCHNEIDER, HYE-SOOK PARK, B. A. REMINGTON, J. H. EGGERT, Lawrence Livermore Natl Lab — Ramp-compression and X-ray diagnostics enable compression and characterization *in-situ* of the transformations happening at extreme laser-driven conditions. Density and pressure can be determined using appropriate calibration standards. However, to fully characterize material properties, temperature determination is key, although difficult to measure in dynamic compression experiments. Extended X-ray Absorption Fine Structure (EXAFS) spectroscopy being sensitive to the local thermal disorder, is a valuable diagnostic. A platform for EXAFS measurements exists at the Omega Laser Facility and its development at NIF is underway. EXAFS measurements require a bright, spectrally smooth, and broad-band x-ray source that can be generated by capsule implosion or laser-irradiated metallic foils. A crystal spectrometer disperses the x-rays and image plate detectors measure the absorption spectra in transmission. EXAFS measurements at the iron K-edge have been collected on the NIF. I will describe the experimental platform and the new ramp-compressed iron data. Pressure, density and temperature determination will be discussed in the framework of the characterization of the iron phase diagram at extreme conditions.

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