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Characterization of short-pulse laser-produced x-rays for diagnosing magnetically driven cylindrical isentropic compression HIROSHI SAWADA, TYLER DAYKIN, BRUNO BAUER, Univ of Nevada - Reno, FARHAT BEG, University of California San Diego — We have developed an experimental platform to study material properties of magnetically compressed cylinder using a 1 MA pulsed power generator Zebra and a 50 TW subpicosecond short-pulse laser Leopard at the UNR's Nevada Terawatt Facility. According to a MHD simulation, strong magnetic fields generated by 100 ns rise time Zebra current can quasi-isentropically compress a material to the strongly coupled plasma regime. Taking advantage of the cylindrical geometry, a metal rod can be brought to higher pressures than that in the planar geometry. To diagnose the compressed rod with high precision x-ray measurements, an initial laser-only experiment was carried out to characterize laser-produced x-rays. Interaction of a high-intensity, short-pulse laser with solids produces broadband and monochromatic x-rays with photon energies high enough to probe dense metal rods. Bremsstrahlung was measured with Imaging plate-based filter stack spectrometers and monochromatic 8.0 keV Cu K-alpha was recorded with an absolutely calibrated Bragg crystal spectrometer. The broadband x-ray source was applied to radiography of thick metal objects and different filter materials were tested. The experimental results and a design of a coupled experiment will be presented.

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