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Characterization of warm dense matter (WDM) from high intensity laser driven shockwaves[1] CHRISTINE KRAULAND, University of California, San Diego, MINGSHENG WEI, General Atomics, JOAO SANTOS, Centre Lasers Intenses et Applications (CELIA), PATRICK BELANCOURT, University of Michigan, WOLFGANG THEOBALD, Laboratory for Laser Energetics, PAUL KEITER, University of Michigan, FARHAT BEG, University of California, San Diego — Understanding the transport physics of an intense relativistic electron beam in various plasma regimes is crucial for many high-energy-density applications, such as fast heating for advanced ICF schemes and ion sources. Most short pulse laser-matter interaction experiments for electron transport studies have been performed with initially cold targets where the resistivity is far from that in warm dense and hot dense plasmas. In order to extend fast electron transport and energy coupling studies in pre-assembled plasmas, we must first characterize those regime possibilities. We present initial experiments conducted on the OMEGA EP laser ($\sim 10^{14}$ W/cm^2) to characterize WDM created from the shock compression of low density ($\rho 0 \sim 330$ mg/cc) CRF foams and solid Al foil targets. In foam targets, imaging x-ray Thomson scattering is used to measure spatial profiles of the temperature, ionization state and relative material density. The ASBO diagnostic and radiation hydrodynamics simulations deduce shock pressure in Al targets of various thicknesses. Details of the experiment and available data will be presented.

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