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Equation-of-State Measurements of Resorcinol Formaldehyde Foam Using Imaging X-Ray Thomson Spectrometer PATRICK BELANCOURT, University of Michigan, W. THEOBALD, Laboratory for Laser Energetics, U. of Rochester, P.A. KEITER, University of Michigan, T.J.B. COLLINS, M.J. BONINO, Laboratory for Laser Energetics, U. of Rochester, P. KOZLOWSKI, University of Oxford, R.P. DRAKE, University of Michigan — Understanding the equation of state of materials under shocked conditions is important for laboratory astrophysics and high-energy-density physics experiments. This talk will focus on experiments dedicated to developing a platform for measuring the equation of state of shocked foams on OMEGA EP. The foam used in the development of this platform is resorcinol formaldehyde foam with an initial density of 0.34 g/cc. One OMEGA EP beam drives a shock into the foam, while the remaining three beams irradiate a nickel foil to create the x-ray backlighter. The primary diagnostic for this platform, the imaging x-ray Thomson spectrometer (IXTS), spectrally resolves the scattered x-ray beam while imaging in one spatial dimension. The IXTS is ideally suited to measure plasma conditions upstream, downstream and at the shock front in the foam. Preliminary results from these experiments will be shown. This material is based upon work supported by the Department of Energy National Nuclear Security Administration under Award Number DE-NA0001944, the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas DE-NA0001840, and by the National Laser User Facility Program DE-NA0000850.

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