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Preliminary results of equation of state measurements using imaging x-ray Thomson spectrometer PATRICK BELANCOURT, University of Michigan, WOLFGANG THEOBALD, Laboratory for Laser Energetics, PAUL KEITER, University of Michigan, TIMOTHY COLLINS, MARK BONINO, Laboratory for Laser Energetics, PAWEL KOZLOWSKI, University of Oxford, PAUL DRAKE, University of Michigan, UNIVERSITY OF MICHIGAN TEAM, LABORATORY FOR LASER ENERGETICS TEAM, UNIVERSITY OF OXFORD TEAM — Understanding the equation of state of materials under shocked conditions is important for laboratory astrophysics and high-energy-density physics experiments. The goal of the experiments discussed here is to create a platform for equation of state measurements in shocked foams on Omega EP. The target of interest for these experiments is shocked carbonized resorcinol formaldehyde foam with an initial density of 0.34 g/cc. Lasers irradiate an ablator, driving a shock into the foam. Plasma conditions ahead of the shock, at the shock and behind the shock are diagnosed using the imaging x-ray Thomson spectrometer (IXTS). The IXTS is capable of spectrally resolving the scattered x-ray beam while imaging in one spatial dimension. Preliminary results from these experiments will be shown. This work is funded by the U.S. Department of Energy, through the NNSA-DS and SC-OFES Joint Program in High-Energy-Density Laboratory Plasmas, grant number DE-NA0001840, and the National Laser User Facility Program, grant number DE-NA0000850, and through the Laboratory for Laser Energetics, University of Rochester by the NNSA/OICF under Cooperative Agreement No. DE-FC52-08NA28302.

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