Abstract Submitted
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**Absolute Hugoniot measurements of polystyrene between 3 and 12 TPa using radiography of a converging shock at the National Ignition Facility**[1] T. DOEPPNER, A.L. KRITCHER, D.C. SWIFT, B. BACHMANN, J. HAWRELIAK[2], G.W. COLLLINS, LLNL, S. GLENZER, SLAC, S.D. ROTHMAN, AWE, D. KRAUS, R.W. FALCONE, UC Berkeley — A converging shock was induced with hohlraum-driven soft x-ray radiation on a solid, spherical sample of poly alpha-methyl styrene. The time-history of density profiles through the sample was measured by x-ray radiography using a laser-heated backlighter and a streak camera, viewing a diameter across the sample through slots in the hohlraum wall. Profile-matching in radius and time was used to increase the accuracy of density inferred from the transmission. The speed and compression of the shock were measured from the density profiles. The shock pressure increased with convergence, so a range of Hugoniot states was obtained from a single experiment. Using a laser power based on the early part of a "high foot" pulse from ignition experiments, the low end of the pressure range was brought down to 2 TPa, overlapping states accessible by experiments in plane geometry, and ensuring that the opacity of the compressed sample was the same as for unshocked material, simplifying the analysis. Shock states were measured up to 12 TPa, when the shock was close to the center of the sample. This is several times higher than has been obtained by other methods and is an absolute measurement.

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