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Localized Density Measurement by Scattered X-Ray Imaging<sup>1</sup> C.M. HUNTINGTON, C.M. KRAULAND, C.C. KURANZ, AOSS, University of Michigan, S.H. GLENZER, Lawrence Livermore National Lab, J.P. KNAUER, Lab for Laser Energetics, University of Rochester NY, R.P. DRAKE, AOSS, University of Michigan — Transmission x-ray radiography has been used successfully as a diagnostic for high energy density experiments for many years. This method is limited, though, as radiographs provide only integrated density measurements along the xray path and require a collinear source-detector configuration. These constraints do not exist for the imaging of x-rays, which may provide localized, point-wise interrogation of density structure inside an experimental package and allows much greater flexibility in source-detector experimental geometry. Here we describe the method of scattered x-ray imaging by defining the forward problem, applying it to model systems, and exploring methods of solving the related inverse problem. Also presented are initial experimental results from scattered x-ray imaging experiments on the Omega Laser at the Lab for Laser Energetics.

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