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Imaging X-Ray Thomson Scattering[1] E.J. GAMBOA, C.C. KURANZ, C.M. HUNTINGTON, M.R. TRANTHAM, R.P. DRAKE, University of Michigan, D.S. MONTGOMERY, J.F. BENAGE, S.A. LETZRING, Los Alamos National Laboratory — In many laboratory astrophysics experiments, intense laser irradiation creates novel material conditions with large, one-dimensional gradients in the temperature, density, and ionization state. X-ray Thomson scattering (XRTS) is a powerful technique for measuring these plasma parameters. However, the scattered signal is typically measured with little or no spatial resolution, which limits the ability to diagnose these inhomogeneous plasmas. We report on an experiment at the Omega laser to diagnose a radiation-driven heat wave in a low density carbon foam [1]. The temperature profile is resolved spatially using a new imaging x-ray Thomson scattering diagnostic. Diffraction of scattered x-rays from a toroidally curved crystal creates high-resolution images that are spatially resolved along a one-dimensional profile in the target while simultaneously spectrally resolving the scattered radiation.

[1] G. Gregori *et al.*, Phys. Rev. Lett. 101, 045003 (2008).

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