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Monochromatic 8.05-keV Flash Radiography of Imploded Cone-in-Shell Targets W. THEOBALD, A.A. SOLODOV, C. STOECKL, V.YU. GLEBOV, S. IVANCIC, F.J. MARSHALL, G. MCKIERNAN, C. MILEHAM, T.C. SANGSTER, Laboratory for Laser Energetics and Fusion Science Center, U. of Rochester, F.N. BEG, C. JARROTT, U. of California, San Diego, E. GIRALDEZ, R.B. STEPHENS, M.S. WEI, General Atomics, M.H. KEY, H. MCLEAN, LLNL, J. SANTOS, CELIA — Fast ignition has the potential of high fusion gains through the ignition of massive DT fuel assemblies. The cone-in-shell target concept might be one way of achieving this goal. Integrated experiments on OMEGA have demonstrated ∼4% coupling efficiency of short-pulse laser energy into the compressed target.[1] An improved target design has been developed with a low-Z cone tip. The goal was to validate 2-D radiation–hydrodynamic modeling predictions of the new target design. The technique used was flash radiography from a monochromatic 8.05-keV x-ray source.[2] Cu foils were irradiated by the 1.5-kJ, 10-ps OMEGA EP short-pulse laser to generate a bright Cu K_α area backlighter source, which was used in combination with monochromatic imaging with a spherical Bragg crystal to backlight the cone-in-shell implosions at various times around peak compression. Flash radiography provides high-quality images of the fuel assembly with ∼10-ps time resolution and ∼10-μm spatial resolution. This work was supported by the U.S. Department of Energy under Cooperative Agreement Nos. DE-FC52-08NA28302 and DE-FC02-04ER54789.

[1]W. Theobald *et al.*, Phys. Plasmas **18**, 056305 (2011).
[2]J. A. King *et al.*, Appl. Phys. Lett. **86**, 191501 (2005).

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