Abstract Submitted
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Demonstration of a 13 keV Kr K-shell X-Ray Source at the National Ignition Facility[1] K.B. FOURNIER, M.J. MAY, J.D. COLVIN, M.A. BARRIOS, J.R. PATTERSON, Lawrence Livermore National Laboratory, S.P. REGAN, Laboratory for Laser Energetics — We report 3% conversion efficiency of laser energy into Kr K-shell (≈13 keV) radiation, consistent with theoretical predictions. This is ≈10× greater than previous work. The emission was produced from a 4.1 mm diameter, 4 mm tall gas pipe target filled with 1.2 or 1.5 atm of Kr gas. 160 of the NIF laser beams deposited ≈700 kJ of 3ω light into the target in a ≈140 TW, 5.0 ns duration square pulse. This laser configuration sufficiently heated the targets to optimize the K-shell x-ray emission. The Dante diagnostics measured ≈5 TW into 4π solid angle of ≥12 keV x rays for ≈4 ns, which includes both continuum emission and flux in the Kr He_α line at 13 keV. This work was performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

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