Abstract Submitted
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K-Photon and Thermal X-Ray-Emission Measurements from Planar Copper Foil Targets Irradiated by High-Intensity Laser Pulses P.M. NILSON, W. THEOBALD, J.F. MYATT, C. STOECKL, P.A. JAANIMAGI, J.A. DELETTREZ, M. STORM, R. BETTI, D.D. MEYERHOFER, T.C. SANGSTER, Laboratory for Laser Energetics, U. of Rochester, J.S. GREEN, K.L. LANCASTER, P.A. NORREYS, RAL, F. BEG, U. of California, San Diego, R.B. STEPHENS, General Atomics, M.H. KEY, LLNL — K-shell x-ray-spectroscopy measurements of small-mass copper foil targets (>20 × 20 × 2 μm^3) irradiated by $I\lambda^2 > 10^{18}$ Wcm$^{-2}\mu$m^2 laser pulses are presented. K_β/K_α variations with increasing energy density using <0.5-kJ, 5-ps laser pulses are fully characterized. Kphoton yields and bulk-electron temperatures calculated by 3-D numerical target-heating simulations are in good agreement with the experimental measurements. The first observation of a transient "double-flash" of x-ray radiation (1 to 2 keV) with increasing energy density indicates a finite-time, thermal-plasma response during the rapid isochoric heating phase. Time-resolved, K-photon emission measurements indicate decompression effects are minimal. This work was supported by U.S. Department of Energy Office of Inertial Confinement Fusion under Cooperative Agreement No. DE-FC52-08NA28302.

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