Abstract Submitted
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High-resolution 15-100 keV K-alpha radiography for high-energy density experiments[1] HYE-SOOK PARK, R. TOMMASINI, M. KEY, A. MACKINNON, P. PATEL, B. REMINGTON, M. TABAK, R. TOWM, LLNL, CA, USA, C. A. BACK, E. GIRALDEZ, GA, CA, USA, C. STOECKL, W. THEOBALD, LLE, NY, USA — We are developing 15-100 keV high-energy x-ray sources for diagnostic radiography for high energy density experiments on new facilities such as Omega-EP, Z-R and NIF. High-energy x-ray sources can be created from hot electron interactions with target materials when illuminated by high intensity lasers. We have performed experiments to characterize and optimize these sources. Our measurements show that the total K-α yield is independent of the target thickness, verifying that refluxing plays a major role in x-ray generation[1]. We demonstrated that high energy (17 to 40 keV) 1-D radiography with the required brightness and spatial resolution for materials experiments on NIF is possible using small-thin foils viewed edge-on. Extending the 1-D concept, we created small point sources for 2-D radiography consisting of micro-wire targets attached to low-Z substrates. We will present absolute K-α yields from small wire targets and the resulting measured spatial resolution of radiographs. We will compare our measurements with hybrid-PIC LSP simulations. 1. H. S. Park et al., PoP, 13, 056309 (2006)

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