

Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

High resolution 17 to 68 keV K-alpha backlighter for high-energy density experiments.¹ HYE-SOOK PARK, B.R. MADDOX, M. KEY, S. LEP-APE, A.G. MACPHEE, P.K. PATEL, T.W. PHILLIPS, B.A. REMINGTON, R. TOMMASINI, Lawrence Livermore National Lab, C.A. BACK, E. GIRALDEZ, General Atomics — Backlighters of energy >17 keV are needed for many high energy density experiments on new facilities such as NIF and Omega-EP. Such high energy source can be created from hot electron interactions with target materials when illuminated by high intensity short pulse lasers. We carried out experiments to demonstrate that high energy 1-D and 2-D radiography is possible using micro-foils and small micro-wires (10 x 10 x 300 microns long) targets attached to low-Z substrates. We have tested Mo (17 keV), Ag (22 keV), Sm (40 keV) and Au (69 keV) micro-foil and micro-wire targets using the Titan laser at LLNL and utilized them to radiograph laser driven samples. We measure spatial resolutions better than 10 μm . We also measured K-alpha yields using a single hit CCD camera and a crystal spectrometer up to Pb (78 keV). This paper will present our radiography results and K-alpha source characteristics comparing them with the required signal level for NIF experiments.

¹This work was performed under the auspices of U.S. Department of Energy by the University of California Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

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Date submitted: 24 Jul 2007

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