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Ultra-intense laser driven high-energy K-α sources for high-energy density experiments.[1] HYE-SOOK PARK, Lawrence Livermore National Lab — When a high-intensity short-pulse laser with the intensity $>10^{17}$ W/cm^2 illuminates a micro target, super-thermal to relativistic hot electrons are created along with the intense magnetic and electric fields. These hot electrons transports through the target material vacating and backfilling of the inner K-shell electrons creating K-α photons. Utilizing this property, we are developing backlighters of energy >17 keV that are needed for many high energy density experiments on NIF and Omega-EP. We carried out experiments to demonstrate that high energy 1-D and 2-D radiography are possible using μ-foil ($\sim$5 μm thin) and μ-wire (10x10x300 μm long) targets attached to low-Z substrates [1]. We have tested Mo (17 keV), Ag (22 keV), Sm (40 keV) and Au (69 keV) backlighters using the Titan laser at LLNL and utilized them to radiograph laser driven samples. This paper will present our radiography results and K-α source characteristics comparing them with the required signal level for NIF HED experiments. [1] H. S. Park et al., Physics of Plasma, 13, 056309 (2006)

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