Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

X-ray backlighter development for high energy density experiments on NIF[1] CHANNING HUNTINGTON, BRIAN MADDOX, HYE-SOOK PARK, MATTHEW TERRY, SHON PRISBREY, CHRISTOPHER PLECHATY, BRUCE REMINGTON, Lawrence Livermore National Lab — Bright, high-energy backlighters are an essential diagnostic tool for experiments on high energy density facilities. Laser driven 5-12 keV thermal He_α x-ray sources are widely used in ICF/HED experiments, and higher energy 17-50 keV cold K_α sources have been developed using short pulse, petawatt lasers. For many x-ray imaging applications, both source brightness and spatial resolution are crucial. In order to optimize these characteristics, we compared the x-ray emission from Ag foils irradiated with 1 μm and $^1/_3$ μm wavelength laser light. We find that single-sided laser illumination of μ-flag foils tamped with diamond on the back side improves the spatial resolution in a point-projection imaging configuration. Monte Carlo methods are adopted to fully understand the diagnostic spatial resolution using x-ray knife-edge data. Experimental results from Omega and NIF are shown where 1D and 2D simulations have been employed to optimize brightness and spatial resolution.

[1]This work was performed under the auspices of the U.S. Department of Energy by LLNL under Contract DE-AC52-07NA27344.

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Date submitted: 12 Jul 2013 Electronic form version 1.4