Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Development of High Fluence X-Ray Sources on the NIF Using Laser Heated Novel Nano-Wire Metal Foams MARK MAY, RUSS BENJAMIN, GREGORY KEMP, PATRICK POOLE, KLAUS WIDMANN, JEFF COLVIN, DANIEL THORN, BRENT BLUE, Lawrence Livermore Natl Lab — High fluence K-shell x-ray sources are being developed for high energy density physics experiments. The sources are produced by laser heating free standing pure Ag nano-wire foams in the shape of cylinders nominally 4 mm in diameter, 4 mm tall. The manufacture of robust low density foams (6 - 12 mg/cm^3) is now possible through a new technique of freeze drying an aqueous suspension of nano-wires. X-ray conversion efficiency from these laser heated underdense nano-wire foams have been measured to be $\sim$0.6% which is about twice that observed in more conventional laser heated cavity x-ray sources. 192 laser beams from NIF are used to heat the foams with $\sim$400 TW of 3ω laser light in a 2.5 ns square pulse in time depositing $\sim$950 kJ into each foam. Experimental results and comparisons with simulations will be presented. This work was done under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract No. DE-AC52-07NA27344.

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Date submitted: 28 Jun 2019 Electronic form version 1.4