

Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Axial x-ray backlighting of wire array Z-pinches using X pinches¹

I.C. BLESENER, J.B. GREENLY, S. PIKUZ, T. SHELKOVENKO, S. VISHNI-AKOU, B.R. KUSSE, D.A. HAMMER, Cornell University — A high resolution axial x-ray imaging system for wire-array Z-pinch experiments has been developed. Calibrated areal density measurements of the Z-pinch plasma; including wire cores, coronal plasma, streaming plasma, and precursor can be obtained. The system uses Mo X pinches in series and below the Z-pinch load to provide point sources of x-rays for point-projection radiography. Images have a 15 mm diameter field of view at the center height of the array and a magnification of about 7.5:1. Ti filters in front of the film transmit continuum radiation in the spectral range of 3-5 keV. A separate film of the same thickness Ti and placed the same distance away with an unobstructed path includes step wedges for calibration of the Z-pinch plasma. The step wedges have thicknesses of W ranging from 0.015 to 1.1 μm to obtain areal density measurements of the W plasma from the wire-array. Images have subnanosecond temporal resolution and about 10 μm spatial resolution. The diagnostic will also be used in the future for imaging thin foil cylinder Z-pinches. Recent calibrated images as well as a discussion of future foil experiments will be presented.

¹This research was supported by the SSAA program of the NNSA under DOE Cooperative Agreement No. DE-FC03-02NA00057.

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Date submitted: 20 Jul 2009

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