

Abstract Submitted
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Experimental study of the dynamics of energetic electron beams in planar and cylindrical wire arrays and x-pinches by means of hard x-ray spectroscopy and spectropolarimetry on the 1 MA z-pinch generator at UNR I. SHRESTHA, V. KANTSYREV, A. SAFRONOVA, K. WILLIAMSON, N. OUART, F. YILMAZ, V. SHLYAPTSEVA, A. ASTANOVITISKY, S. BATIE, B. LEGALLOUDEC, V. NALAJALA, W. MCDANIEL, T. COWAN, University of Nevada, Reno — Experiments with planar and cylindrical wire arrays and x-pinches were performed at the 1MA, 100 ns rise time Zebra generator. A time-resolved hard x-ray polarimeter ($>30\text{keV}$) based on Compton scattering effect has been used together with fast hard and soft x-ray detectors, a time-gated pinhole camera, and a hard x-ray spectrometer. The different types of electron beams were investigated using silicon diode signals (filters with cut off energies $>2\text{keV}$, $>9\text{keV}$, $>30\text{keV}$) by comparing with hard x-ray polarimeter signals. The experimental observation of cold $K\alpha$ lines were also used for investigation of high energy electron beams. Estimated degrees of polarization of x-ray radiation varies from 38 % to 70% for different types of plasma electron beams. Electron beams are more collimated in a cathode to anode direction for cylindrical wire arrays than for planar wire arrays and X-pinches. Work supported by the DOE/ NNSA under UNR grant DE-FC52-01NV14050.

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