Abstract Submitted for the DPP09 Meeting of The American Physical Society

Spectroscopic study of z-pinch K-shell x-ray sources<sup>1</sup> B. JONES, G.A. ROCHAU, J.E. BAILEY, D.J. AMPLEFORD, C.A. COVERDALE, S.B. HANSEN, C.A. JENNINGS, M.E. CUNEO, Sandia National Laboratories, Y. MARON, V. FISHER, V. BERNSHTAM, A. STAROBINETS, L. WEINGARTEN, Weizmann Institute, J.P. APRUZESE, A. DASGUPTA, R.W. CLARK, J.W. THORNHILL, K.G. WHITNEY, J.L. GIULIANI, J. DAVIS, Naval Research Laboratory — Fast z-pinches provide intense 1-10 keV photon energy radiation sources. Analysis of time-integrated K-shell x-ray spectra indicates electron temperatures up to 5 keV and ion densities of order  $10^{20}$  cm<sup>-3</sup> in the stagnated plasma created from wire array implosions on Sandia's Z machine pulsed power driver. Elliptical crystal spectrometers coupled to microchannel plate detectors, fielded previously on Z, have recently provided time-resolved spectral measurements for Al (~2 keV), stainless steel (~6.7 keV), and Cu (~8.4 keV) sources. We discuss implosion and stagnation dynamics, plasma conditions, and spectral analysis in the presence of opacity and Doppler effects.

<sup>1</sup>Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Brent Jones Sandia National Laboratories

Date submitted: 20 Jul 2009

Electronic form version 1.4