

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

K-Shell Emission from Z-pinches: Z to ZR C. DEENEY, C.A. COVERDALE, B. JONES, Sandia National Labs, J.W. THORNHILL, A.L. VELIKOVICH, R.W. CLARK, Y.K. CHONG, J.P. APRUZESE, J. DAVIS, Naval Research Lab, K.G. WHITNEY, Berkeley Scholars, P.D. LEPELL, Ktech Corporation — K-shell z-pinch sources studied at the Z Accelerator over the last few years have produced significant K-shell x-ray output from argon, titanium, stainless steel, and copper. K-shell scaling theories (1), which identify initial load conditions necessary to get enough mass to implode at a high enough velocity to achieve plasma temperatures and densities required for K-shell emission, were benchmarked against K-shell emission data from <8 MA facilities and photon energies up to 3 keV. The experimental results from the sources at Z have demonstrated the heuristic validity of the models and provided data to fine tune the models for higher photon energies and currents. In this paper, the results of K-shell scaling experiments from Z will be presented, as well as the expected scaling of these sources to ZR (26 MA). Plasma conditions from the Z experiments will be discussed within the context of efficient K-shell production, to identify the appropriate plasma conditions necessary for efficient production at ZR. Calculated results for expected ZR outputs will be presented. (1) K.G. Whitney et. al., J. App. Phys., 67 1725 (1990). Sandia is a multi-program laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the United States Department of Energy under Contract DE-AC04-94AL85000. Naval Research Lab work was supported by DTRA.

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Date submitted: 20 Jul 2006

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