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X-Ray Emission Trends with Atomic Number and Initial Array Radius from K-Shell Z Pinches C.A. COVERDALE, B. JONES, D.J. AMPLEFORD, M.E. CUNEO, Sandia National Labs, C. DEENEY, NNSA/DOE, P.D. LEPELL, Ktech Corp., K.G. WHITNEY, Berkeley Research Associates, J.W. THORNHILL, J. GIULIANI, J. DAVIS, J.P. APRUZESE, A. DASGUPTA, NRL — Experiments at the pre-refurbished Z facility covered a wide range of K-shell x-ray sources, including Ti (4.7 keV), SS (6.7 keV), and Cu (8.4 keV). The initial wire array radius of single and nested configurations was varied for each of these materials. The total x-ray emission decreased with larger diameter wire arrays for all materials, and nested arrays generally produced higher powers than single arrays. The K-shell emission for Ti behaved as expected based on the K-shell scaling theory [J.W. Thornhill et al., Phys. Plasmas **1**, 321 (1994)], with decreases in K-shell output observed for η <2 and for mass $<$ soft mass breakpoint (m_{bp}). For SS, the scaling theory would predict inefficient K-shell emission for all the loads fielded (η > 2, but mass $<$ soft m_{bp}), although the K-shell output increased for larger diameter loads, even with masses $<$ soft m_{pb}. Emission from the higher atomic number arrays appears to be dominated by regions of brightly emitting plasma. 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.

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