

Abstract Submitted
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Variations on Nested Stainless Steel Wire Arrays¹ B. JONES, C.A. COVERDALE, C. DEENEY, D.J. AMPLEFORD, E.M. WAISMAN, Sandia National Laboratories, P.D. LEPELL, Ktech Corp. — K-shell x-ray production requires high plasma temperatures (>3 keV for stainless steel), which ultimately dictates load designs with large initial radii and low mass. These loads are susceptible to Rayleigh-Taylor implosion instability. To mitigate this, we have explored nested wire arrays (55 mm and 75 mm outer diameter) with a variable inner wire array configuration. Nested arrays with 55 on 27.5 mm diameter, 2:1 mass ratio (outer:inner) retain their total and K-shell radiation output with a smaller, lighter inner array, but care must be taken to ensure simultaneous stagnation of the two arrays, accounting for transparency of the inner array to the imploding outer material. The addition of a third 13.75 mm array to the 55 on 27.5 mm Z load increased the total x-ray power while keeping the yield fixed and resulted in an enhanced x-ray foot prior to the main emission peak.

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