Abstract Submitted
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Nonlinear Interaction Between the Radiation and Multidimensional Plasma in Large Diameter Structured Argon Gas Puff Z-Pinch Loads[1] Y.K. CHONG, J.W. THORNHILL, A.L. VELIKOVICH, J.P. APRUZESE, J. DAVIS, Plasma Physics Division, NRL, N. QI, H. SZE, J.S. LEVINE, B.H. FAILOR, L-3 Communications Pulse Sciences — It has recently been demonstrated that one can efficiently produce K-shell x-ray radiation with z pinches imploded from larger initial diameters, by longer current pulses than previously thought possible, using a "pusher-stabilizer-radiator" load formed by a supersonic nozzle injecting outer and inner annular shells and a high-density central jet between the cathode and the anode [1]. We present a detailed numerical investigation of the implosions of such loads. Our simulations were performed with the 2D RMHD Mach2 code incorporating the dynamical domain tabular collisional radiative equilibrium (DDTCRE) radiation transport model [2]. This model provides a realistic description of the self-consistent multidimensional non-local non-LTE ionization dynamics and radiation transport physics in a computationally efficient manner. A numerical simulation analysis of various nozzle load configurations, with/without the central jet and/or shells, is used to further assess and validate the physical model by simulating the experimental spectra, plasma images and radiation emission characteristics. [1] H. Sze et al., PRL **95**, 105001(2005). [2] Y. K. Chong et al., ICOPS 2005, Monterey, CA.

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Alexander Velikovich
Naval Research Laboratory

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