Abstract Submitted
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Spectroscopic study of z-pinch stagnation[1] B. JONES, C.A. JENNINGS, E.P. YU, S.B. HANSEN, G.A. ROCHAU, J.E. BAILEY, C.A. COVERDALE, D.J. AMPLEFORD, M.E. CUNEO, Sandia National Laboratories, Y. MARON, V. FISHER, V. BERNSHTAM, A. STAROBINETS, L. WEINGARTEN, Weizmann Institute — Fast z-pinches provide intense 1-10 keV photon energy radiation sources. Here, we analyze time-, space-, and spectrally- resolved $\sim$2 keV K-shell emissions from Al (5% Mg) wire array implosions on Sandia′s Z machine pulsed power driver. The stagnating plasma is modeled as three separate radial zones, and collisional-radiative modeling with radiation transport calculations are used to constrain the temperatures and densities in these regions, accounting for K-shell line opacity and Doppler effects. We discuss plasma conditions and dynamics at the onset of stagnation, and compare inferences from the atomic modeling to three-dimensional magneto-hydrodynamic simulations.

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