Abstract Submitted
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Measurements of three-dimensional instability growth of the imploding mass distribution for single and nested wire arrays[1] M.E. CUNEO, D.B. SINARS, G.R. BENNETT, E.P. YU, R.W. LEMKE, M.P. DESJARLAIS, R.G. ADAMS, D.E. BLISS, M.C. JONES, G.T. LEIFESTE, J.L. PORTER, I.C. SMITH, W.A. STYGAR, E.M. WAISMAN, Sandia National Laboratories — Radiographic measurements at 6.151 keV show that the imploding mass distribution of a wire array z-pinch has the character of the magneto-Rayleigh Taylor instability [1]. Although the instability wavelength λ and amplitude Δ are similar on either side of the z-pinch axis, detailed instability features (individual bubbles and spikes) are misaligned, which indicates a partly three-dimensional character, with some azimuthal incoherence. The temporal characteristics of the x-ray power are correlated with the instability amplitude near the axis at stagnation. Tailoring of the radial mass density profile of the z-pinches using current-transfer nested-arrays [2] and axial CH_2 foams leads to improved pulse compression, smaller amplitude Δ and x-ray powers of up to 220-240 TW. The data may support a self-similar spatio-temporal evolution with $\lambda \sim \Delta$ during part of the implosion. [1] D. B. Sinars et al., Phys. Plasmas [2005], [2] M. E. Cuneo, et al., Phys. Plasmas [2006]

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M.E. Cuneo

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