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High-Z Pusher Experiments on the Cobra Triple Nozzle Gas-Puff Z-Pinch[1] PHILIP DE GROUCHY, Cornell University, NIANSHENG QI, L-3 Communications, Oakland CA, BRUCE KUSSE, CHARLES SEYLER, LEVON ATOYAN, TOM BYVANK, ADAM CAHILL, JOHN GREENLY, CAD HOYT, Cornell University, SERGEI PIKUZ, TANIA SHELKOVENKO, Lebedev Physical Institute, Moscow, DAVID HAMMER, Cornell University — For inertial confinement fusion application and as efficient hard x-ray sources, the imploding sheath of a gas-puff z-pinch or thin liner must be accelerated to the highest possible velocity before hydrodynamic instabilities significantly disrupt the implosion symmetry. Much recent work has focused on increasing implosion stability using radially structured mass-density profiles produced by multi-nozzle gas-puff valves. The introduction of a high-Z element such as xenon into the outer gas shells in such experiments can modify radiation output during the implosion phase as well as at stagnation. In these experiments xenon is introduced into the triple-nozzle gas valve fielded on the (1MA, 200ns) COBRA z-pinch machine at Cornell University. The xenon is introduced only in the outer shell, only in the inner shell or in both, to investigate the radiative effects on implosion hydrodynamics and x-ray yield. Results are compared to those obtained during pure argon implosions with the same mass-density profile. Sheath thicknesses and stability are recorded using laser interferometry (532nm) and multi-frame imaging systems. The distribution of flow velocities and of high-Z material across the pinch is investigated using a (5GW, 527nm) Thomson scattering probe.

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