

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Gas puff Z-pinches with deuterium-krypton gas mixtures¹ TIMOTHY DARLING, ERIK MCKEE, AARON COVINGTON, VLADIMIR IVANOV, Nevada Terawatt Facility, UNR, FRANK WESSEL, HAFIZ RAHMAN, Magneto-Inertial Fusion Technologies, Inc. — We discuss experiments with single-shell, pure and mixed-gas loads on the zebra pulsed-power generator at the Nevada Terawatt Facility (NTF). These experiments are modeled using the MACH2 code and provide input and benchmarking for further models and experiments on upcoming staged Z-pinch (SZP) studies under an ARPA-E program. The 1MA-70ns rise time discharge of Zebra produces bursts of both high and low energy X-rays and neutrons if deuterium gas is present. The gas is injected from the (grounded) anode to cathode as an expanding cylindrical shell of approximately 4cm diameter. A pulsed valve and a flow-forming nozzle determine the details of the gas target geometry which is imaged as a density map using a UV excited fluorescent tracer (LIF). The gases imaged are pure Kr and D2 and binary mixtures thereof. A pure D2 pinch produces a (yet to be optimized) neutron yield in the $1e10$ regime. Additional diagnostics include a 2-frame Schlieren 1064nm IR imaging diagnostic, which provides information on the implosion dynamics of the pinch.

¹Support for this work comes from DOE/NNSA (grant # DE-NA0002075) and the ARPA-E ALPHA program.

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Date submitted: 24 Jul 2015

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