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Abstract Submitted
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Staged Z-pinch Experiments at the 1MA Zebra pulsed-power generator: Neutron measurements[1] EMIL RUSKOV, Magneto-Inertial Fusion Technologies, Inc. (MIFTI), T. DARLING, Univ.of Nevada, Reno (UNR), V. GLEBOV, Laboratory for Laser Energetics, Rochester, F. J. WESSEL, (MIFTI), A. ANDERSON, (UNR), F. BEG, Univ.of California, San Diego (UCSD), F. CONTI, (UCSD), A. COVINGTON, (UNR), E. DUTRA, National Security Technologies, LLC, J. NARKIS, (UCSD), H. RAHMAN, (MIFTI), M. ROSS, J. VALENZUELA, (UCSD) — We report on neutron measurements from the latest Staged Z-pinch experiments at the 1MA Zebra pulsed-power generator. In these experiments a hollow shell of argon or krypton gas liner, injected between the 1 cm anode-cathode gap, compresses a deuterium plasma target of varying density. Axial magnetic field $B_z \leq 2kGs$, applied throughout the pinch region, stabilizes the Rayleigh-Taylor instability. The standard silver activation diagnostics and 4 plastic scintillator neutron Time of Flight (nTOF) detectors are augmented with a large area ($\sim 1400cm^2$) liquid scintillator detector to which fast *gated* Photek photomultipliers are attached. Sample data from these neutron diagnostics systems is presented. Consistently high neutron yields $Y_{DD} > 10^9$ are measured, with highest yield of 2.6×10^9. A pair of horizontally and vertically placed plastic scintillator nTOFs suggest isotropic i.e. thermonuclear origin of the neutrons produced. nTOF data from the liquid scintillator detector was cross-calibrated with the silver activation detector, and can be used for accurate calculation of the neutron yield.

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