Abstract Submitted
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Validation of MHD Simulations Using Spectroscopically Characterized O Gas-Puff Z-Pinches.[1] NICHOLAS AYBAR, University of California, San Diego, MAYLIS DOZIERES, University of California San Diego, MARKO CVEJIC, DIMITRY MIKITCHUK, Weizmann Institute of Science, FABIO CONTI, University of California San Diego, EYAL KROUPP, YITZHAK MARON, Weizmann Institute of Science, FARHAT BEG, University of California San Diego — Gas-puff z-pinches have been studied for decades for a variety of applications ranging from controlled thermonuclear fusion to its use as a bright X-ray source. Magnetohydrodynamic (MHD) simulations in conjunction with experimental data are necessary to study the physical processes at play throughout the dynamic Z-pinch implosion process. Here we present a comprehensive parameterization of gas-puff z-pinches carried out on a 300 kA peak current, 1.6 us rise time driver at the Weizmann Institute of Science. Gas discharges made with O_2 included simultaneous spectroscopic measurements of electron density (n_e), temperature (T_e), and azimuthal (B_θ) and axial (B_z) magnetic fields. The experimental parameters were juxtaposed against results from one and two-dimensional MHD simulations conducted using HYDRA to explore the underlying physics.

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