

Abstract Submitted
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Zeeman Spectroscopic Determination of Magnetic Field in Gas-Puff Z-Pinches¹ JAY ANGEL, EUAN FREEMAN, SANDER LAVINE, DAVE HAMMER, Cornell, CORNELL UNIVERSITY LABORATORY OF PLASMA STUDIES TEAM — Zeeman Polarization Spectroscopy on 1 MA gas-puff z-pinches in Argon and Krypton is being used to determine the magnetic field distribution in the plasma during implosion. Light is collected parallel to the azimuthal magnetic field tangential to the gas puff implosion sheath. The light is split into left and right hand circularly polarized components and then focused into two linear fiber bundles and delivered to a 750 mm spectrometer. The Zeeman components can resolve the peaks of the two polarizations despite Stark Broadening. Introducing dopants into the gas puff will allow the use of additional emission lines, such as the Carbon IV doublet at 580.1 nm and 581.2 nm, to increase spatial resolution. This method was developed for z-pinch experiments on a 500 kA, 500 ns rise time generator by G. Rosenzweig, E. Kroupp, A. Fisher and Y. Maron, “Measurements of the spatial magnetic field distribution in a z-pinch plasma throughout the stagnation process” JINST 12, P09004 (2017) as part of the Cornell/NNSA pulsed power center.

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