Abstract Submitted
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Spectroscopy Measurements on the ZaP-HD Experiment[1] RAYMOND GOLINGO, U. SHUMLAK, B.A. NELSON, S.A. DOTY, D. GOLDSTONE, M.C. HUGHES, S.D. KNECHT, M.P. ROSS, Univ of Washington — The ZaP-HD experiment is studying the scaling relationships necessary to bring a sheared-flow stabilized Z-pinch into the HEDP regime. In the ZaP experiment, a single spectrometer was used to measure velocities of up to 10^5 m/s, ion temperatures of up to 100 eV, magnetic fields of 1 T, and densities of 10^{21} m^{-3} using the Doppler shift and broadening, Zeeman splitting, and Stark broadening of the impurity line radiation. Local quantities are found with a deconvolution method. The success of the measurements was partially due to an accurate calibration of the spectrometer using an image warping technique and a collection system that uses telecentric telescopes. The adiabatic scaling relations predict that an increase of the pinch current from 50 kA to 750 kA will lead to velocities of 10^5 m/s, temperatures of 4.5 keV, pinch radius of 0.17 mm, and densities of 2×10^{26} m^{-3} in the Z-pinch. A review of the results from the ZaP experiment will be given. The improvements to the system necessary to make measurements of the smaller, hotter plasma will be shown. Initial velocity and temperature measurements will also be presented.

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