Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Overview and Recent Results from the ZaP Flow Z-Pinch[1] U. SHUMLAK, B.A. NELSON, C.S. ADAMS, D.M. CHAHIM, D.J. DEN HARTOG, R.P. GOLINGO, S.D. KNECHT, R. OBERTO, M. SYBOUTS, G. VOGMAN, Aerospace and Energetics Research Program, University of Washington — The ZaP Flow Z-Pinch investigates a magnetic confinement configuration that relies on sheared flow for stability in an otherwise unstable configuration. An axially flowing Z-pinch is generated with a coaxial accelerator coupled to a pinch assembly chamber. Magnetic probes measure fluctuation levels. Plasma is magnetically confined for an extended quiescent period where the mode activity is reduced. Doppler shift measurements of impurity lines show sub-Alfvenic, sheared flow during the quiescent period and low shear profiles during periods of high mode activity. The plasma has a sheared axial flow that exceeds the theoretical threshold for stability during the quiescent period and is lower than the threshold during periods of high mode activity. A holographic interferometer measures radially peaked density profiles during the quiescent period. Density profiles are analyzed to determine equilibrium profiles. Internal magnetic fields have been determined by measuring the Zeeman splitting of impurity emission. Measurements are consistent with a magnetically confined plasma. Plasma lifetime appears to be limited by neutral gas supply.

[1]This work is supported by a grant from DOE.

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Date submitted: 21 Jul 2007 Electronic form version 1.4