Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Experimental Investigation of the Effects of an Axial Magnetic Field on the Magneto-Rayleigh-Taylor Instability in Ablating Planar Foils[1] D.A. YAGER-ELORRIAGA, S.G. PATEL, A.M. STEINER, N.M. JORDAN, M.R. WEISS, R.M. GILGENBACH, Y.Y. LAU, Nuclear Eng. & Rad. Sciences Department, Univ. of Michigan — Experiments are underway to study the effects an axial magnetic field on the magneto-Rayleigh-Taylor instability (MRT) in ablating planar foils on the 1-MA LTD at the Michigan Accelerator for Inductive Z-pinch Experiments (MAIZE) facility at the University of Michigan. For 600 kA drive current, a 15 T axial magnetic field is produced using helical return current posts. During the current pulse, the magnetic field may diffuse into the foil, creating a sheared magnetic field along with the possibility of shear stabilization of the MRT instability. Theoretical investigation at UM has shown that a sheared azimuthal magnetic field coupled with an axial magnetic field reduces the MRT growth rate in general. In order to study this effect, the amount of magnetic shear is controlled by offsetting the initial position of the foil. A 775 nm Ti:sapphire laser will be used to shadowgraph the foil in order to measure the MRT growth rate. By comparing these results to previous experiments at UM, the effects of magnetic shear and an axial magnetic field will be determined.

[1]This work was supported by US DoE. S.G. Patel and A.M. Steiner supported by NPSC funded by Sandia. D.A. Yager-Elorriaga supported by NSF fellowship grant DGE 1256260.

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Date submitted: 11 Jul 2014 Electronic form version 1.4