Abstract Submitted
for the DPP20 Meeting of
The American Physical Society

Characterization of Pulsed-Power Magnetized Jets on MAIZE[1]
RAUL MELEAN, RACHEL YOUNG, SALLE KLEIN, TREVOR SMITH, GEORGE DOWHAN, PAUL CAMPBELL, NICHOLAS JORDAN, RYAN MCBRIDE, R PAUL DRAKE, CAROLYN KURANZ, University of Michigan —
We present the first results of a laboratory-astrophysics experiment with the goal of characterizing magnetized plasma jets on the Michigan Accelerator for Inductive Z-Pinch Experiments (MAIZE) in the Plasma, Pulsed Power, and Microwave Laboratory at the University of Michigan. We aim to explore the interactions of magnetized plasma flows with external magnetic fields and the behavior of the different plasma flows created by conical wire-arrays (hot coronal plasma and radiatively cooled jets). In these first preliminary results, we focus on the structure and development of shock instabilities. To generate the magnetized plasma flows, we used MAIZE to ablate 100-micron, aluminum wire arrays with currents in the order of 500 Kilo-Amp with a rise time of 250 ns. We use a conical array to drive an axial plasma jet, while a Helmholtz coil provides a uniform 5-T axial magnetic field. Our first images come from visible self-emission and shadowgraphy (532 nm), captured by a fast-frame camera, showing the structure and evolution of the plasma jet.

[1]This work is supported by the U.S. Department of Energy's NNSA SSAP under cooperative agreement numbers DE-NA0003869 and DE-NA0003764.

Raul Melean
University of Michigan

Date submitted: 10 Jul 2020 Electronic form version 1.4