Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Plasma Jets Subject to Adjustable Current Polarities and External Magnetic Fields TOM BYVANK, PETER SCHRAFEL, PIERRE GOURDAIN, CHARLES SEYLER, BRUCE KUSSE, Laboratory of Plasma Studies, Cornell University — In the present research, collimated plasma jets form from ablation of a radial foil (Al 20 μm thin disk) using a pulsed power generator (COBRA) with 1 MA peak current and 100 ns rise time. Plasma dynamics of the jet are diagnosed with and without an applied uniform external field (1-1.5 T) and under a change of current polarities, which correspond to current moving either radially outward or inward from the foil's central axis. Experimental results are compared with numerical simulations (PERSEUS). The influence of the Hall effect on the jet development is observed under opposite current polarities. Additionally, the magnetic field compression within the jet is examined. Further studies will compare the laboratory-generated plasma jets and astrophysical jets with embedded magnetic fields.

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Date submitted: 10 Jul 2014 Electronic form version 1.4