Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Magnetized, radiative shocks in aluminum plasma flows JOHN GREENLY, CHARLES SEYLER, XUAN ZHAO, Cornell University — Arrays of aluminum wires driven by the 1 MA, 200 ns COBRA generator are used to produce uniform sheet flows of several cm scale size, consisting of multiply ionized aluminum plasma with velocity up to 400 km/s, density $\sim 10^{18}/\mathrm{cm}^3$ and variable magnetic field of several Tesla. Shocks are produced by obstacles placed in the flow. The shock structures radiate strongly in the XUV, as shown by imaging diagnostics. Laser shadowgraphy and interferometry are also used, and sub-mm size magnetic probes are used to measure the fields associated with the shocks. Unstable shock structures are also observed at the leading edge of the flow when no physical obstacles are used; this structure is formed by the collision of the flow with the low-density cold background gas in the experimental chamber. The experimental results will be compared with simulations using the XMHD code PERSEUS, which shows characteristic magnetic signatures of these structures.

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Date submitted: 19 Jul 2012 Electronic form version 1.4