Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Directed Plasma Flow across Magnetic Field[1] R. PRESURA, Y. STEPANENKO, S. NEFF, V.I. SOTNIKOV, Nevada Terawatt Facility, University of Nevada, Reno — The Hall effect plays a significant role in the penetration of plasma flows across magnetic field. For example, its effect may become dominant in the solar wind penetration into the magnetosphere, in the magnetic field advection in wire array z-pinch precursors, or in the arcing of magnetically insulated transmission lines. An experiment performed at the Nevada Terawatt Facility explored the penetration of plasma with large Hall parameter ($\sim$10) across ambient magnetic field. The plasma was produced by ablation with the short pulse high intensity laser Leopard (0.35 ps, 10^{17}W/cm^2) and the magnetic field with the pulsed power generator Zebra (50 T). The expanding plasma assumed a jet configuration and propagated beyond a distance consistent with a diamagnetic bubble model. Without magnetic field, the plasma expansion was close to hemispherical. The ability to produce the plasma and the magnetic field with distinct generators allows a controlled, quasi-continuous variation of the Hall parameter and other plasma parameters making the experiments useful for benchmarking numerical simulations.

[1]Work supported by NNSA grant DE-FC52-06NA27616

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Date submitted: 14 Jan 2008 Electronic form version 1.4