

Abstract Submitted
for the APR08 Meeting of
The American Physical Society

Laboratory investigation of bow shocks in radiatively cooled plasmas¹ D.J. AMPLEFORD, C.A. JENNINGS, Sandia National Laboratories, S.V. LEBEDEV, G.N. HALL, S.N. BLAND, S.C. BOTT, F. SUZUKI-VIDAL, J.B.A. PALMER, J.P. CHITTENDEN, Imperial College London, A. CIARDI, Observatoire de Paris — Magnetized and radiatively cooled shocks are present in many astrophysical systems. The early stage of a wire array z-pinch implosion consists of the steady ablation of material from fine metallic wires. Ablated material is accelerated toward the array axis by the $J \times B$ force. This flow is highly supersonic ($M > 5$) and becomes super-Alfvenic ($MA > 2$). Radiative cooling is significant in this flow, and can be controlled by varying the material in the ablated plasma. The introduction of a wire as an obstruction in this steady flow leads to the formation of bow shocks. The magnetic field associated with this obstruction wire can be controlled by varying the current through it. Differences in the shock for different cooling rates and different magnetic fields associated with the obstruction will be discussed.

¹Sandia is a multiprogram laboratory operated by Sandia Corporation, a Lockheed Martin Company, for the US DOE's NNSA under contract DE-AC04-94AL85000.

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Date submitted: 16 Jan 2008

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