

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Plasma dynamics in an inverse wire array z-pinch¹ SERGEY LEBEDEV, S.N. BLAND, S.C. BOTT, J.P. CHITTENDEN, G.N. HALL, F.A. SUZUKI, Imperial College, A. CIARDI, Paris Observatory, J.B.A. PALMER, AWE, Aldermaston — We describe experiments on the MAGPIE facility (1MA, 250ns) with inverse wire array z-pinches, in which the wires act as a return current cage placed around a central current conductor. In this configuration the plasma ablated from the wires is pushed by the $J \times B$ force in the radially outward direction and expands into the region free of the magnetic field. The parameters of the coronal plasma were measured using laser interferometry, X-ray and XUV imaging. The experimental set-up also allows addition of axial and radial magnetic fields, and we study the effects of these fields on the plasma dynamics and the ablation rate. The complete ablation of the wires triggers radial “explosion” of the plasma which proceeds through formation of gaps in the wire cores, similar to the dynamics of standard wire arrays. The opening of the current path in the final stages could potentially be used as a plasma opening switch.

¹This research was sponsored by the NNSA under DOE Cooperative Agreement DE-F03-02NA00057

Sergey Lebedev
Imperial College

Date submitted: 20 Jul 2006

Electronic form version 1.4