Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Cylindrical Liner Z-pinch Experiments on MAGPIE[1] GUY BURDIAK, SERGEY LEBEDEV, ADAM HARVEY-THOMPSON, GEORGE SWADLING, FRANCISCO SUZUKI-VIDAL, PHILIP DE GROUCHY, JONATHON SKIDMORE, GARETH HALL, ESSA KHOORY, LOUISA PICKWORTH, LEE SUTTLE, SIMON BLAND, Imperial College London — The formation of plasma in thin-walled metal tube (liner) experiments on the MAGPIE generator (1.4 MA, 240 ns rise) was investigated using axial and side-on laser probing and self-emission imaging. Liners with a wall thickness comparable to the initial current skin depth allow magnetic field diffusion through the wall, driving a cylindrically converging plasma flow from the inner surface at a speed of approximately 100 km s^{-1}. Initial flow has good azimuthal symmetry, with radial striations appearing later. The growth and azimuthal correlation of plasma instabilities on the outer liner surface is also observed, in conditions where no bulk motion of the liner occurs. Finally, the effect upon ablation dynamics of filling the interior of the liner with gas prior to application of the current pulse is presented.

[1]Supported by ISP.

Guy Burdiak
Imperial College London

Date submitted: 18 Jul 2011 Electronic form version 1.4