

Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Experimental Study of an Inverse Wire Array Z-Pinch Operating as a Current Switch¹ SERGEY LEBEDEV, Imperial College, A. HARVEY-THOMSON, G.N. HALL, E.M. WAISMAN, E. KHOORY, G. BURDIAC, J.P. CHITTENDEN, P. DE GROUCHY, F.A. SUZUKI-VIDAL, G. SWADLING, S.N. BLAND, L. PICKWORTH, J. SKIDMORE, L. SUTTLE, Imperial College — We will present experiments on the MAGPIE facility (1.5MA, 250ns) in which an inverse wire array [1] (with the wires acting as a return current cage placed around a central current conductor) operated as a fast current switch. This allowed to significantly reduce the rise-time of the current pulse (<100ns) delivered to a separate, standard imploding wire array z-pinch load. Experimental studies of the operation of this arrangement as a current switch will be discussed and new measurements of current switching into the load array will be presented. We will also discuss how pre-conditioning of the load array wires by the current pre-pulse [2] depends on wire materials (Al, Cu, W) used in the load and the exploding wire arrays.

[1] A. Harvey-Thompson, S.V. Lebedev, S.N. Bland et al., PoP 16, 022701 (2009).

[2] A. Harvey-Thompson, S.V. Lebedev, G. Burdiak, et al., PRL 106, 205002 (2011)

¹This research was sponsored by the NNSA under DOE Cooperative Agreement DE-FC03-02NA00057.

Sergey Lebedev
Imperial College

Date submitted: 13 Jul 2011

Electronic form version 1.4