

EXPERIMENTAL STUDY OF AN INVERSE WIRE ARRAY Z-PINCH OPERATING AS A CURRENT SWITCH*

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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 [2]. 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. In particular it was found that this arrangement generates a short current pre-pulse (~5kA, <15ns) through the imploding array, followed by a ~140ns interval with zero current, before the main fast rising current pulse is switched into the array. This led to a significant change in the implosion dynamics, suppressing the ablation phase, introducing a 0-D-like implosion and reducing the level of trailing mass.

1. A. Harvey-Thompson, S.V. Lebedev, S.N. Bland et al., PoP **16**, 022701 (2009).
2. S.V. Lebedev A. Harvey-Thompson, G.N. Hall et al., BAPS.2009.DPP.GO5.5 (2009).

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