

Abstract Submitted
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Reverse polarity x-pinch operation I.C. BLESENER, P.U. DUSELIS, B.R. KUSSE, S.A. PIKUZ, T.A. SHELKOVENKO, Laboratory of Plasma Studies, Cornell University, Ithaca NY 14853 — Conventionally an x-pinch is operated in negative polarity. That is to say the x-pinch wires are driven negative with respect to the ground of the pulsed power generator. This is largely due to the fact that breakdown in these machines is easier to prevent when they are operated in negative polarity. Low current experiments (1-5 kA) studying the explosions of single wires have shown that more energy can be deposited in the wires when they are driven in positive as opposed to negative polarity. These results have raised the question of what happens when pinch-type experiments are driven in positive polarity. Recently it has become possible to use the 450 kA XP pulser at Cornell to drive x-pinches in positive polarity. We present here the results of a series of experiments comparing the operation of an x-pinch in positive and negative polarity. Of particular interest are the x-ray yield, timing, radiating spot size and the number of radiating spots in a given x-pinch. This research was supported by DOE grant DE-FG03-98ER54496, by Sandia National Laboratories contract AO258, and by the NNSA Stockpile Stewardship Academic Alliances program under DOE Cooperative Agreement DE-FC03-02NA00057.

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