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Polarity Contact and Risetime Effects on Wire Array Z-Pinches[1]

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— The Cornell COBRA pulser is a 1MA, negative polarity machine. COBRA can operate with 100 to 200 ns current risetimes. Wires are typically strung with a "press" contact to the electrode hardware, where the wire is loosely pulled against the hardware and held there to establish electrical contact. The machine is normally negative, but a bolt-on convolute can be used to modify the current path and change the electric field at the wires, thereby producing positive polarity with respect to ground at the load. Data presented are the culmination of experiments studying the combined effects of contact, polarity and risetime on wire array z-pinches. Data were collected on 16-wire Aluminum z-pinch arrays in both negative and positive polarity, with solder and non-solder contacts, and with slow and fast risetimes (100ns and 200ns). Five shots were collected for each case. The initiation, ablation, implosion and stagnation phases were compared for the various cases.

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