

Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Wire array response to current pulse shape variation on COBRA using laser-triggered switching¹ J.B. GREENLY, J.D. DOUGLASS, D.A. CHELINSKI, D.A. HAMMER, B.R. KUSSE, R.D. MCBRIDE, L.M. MAXSON, Cornell University — The COBRA Z-pinch pulser uses four independent pulseforming lines with a vacuum adder, to allow considerable variation in the driving pulse shape for investigations of wire array physics. Laser-triggered gas switches control the timing of the four lines. Jitter is <5 ns when laser-triggered at 70% or more of self-break. With all four lines switched simultaneously, zero to peak risetime is 95 ns, 10-90% time is 55 ns, peak current is 1 MA. With two lines delayed 120 ns, zero to peak is 205 ns, 10-90% is 165 ns, 0.9 MA peak. The response of wire array loads is being observed, using the pulse regimes described above, as well as the case in which one line is switched out early to make a substantial “prepulse” or foot on the load current. COBRA employs an inductive load voltage monitor, a ~60 cm long wire connected from the cathode in the convolute region to ground. This monitor is able to see the resistive voltage associated with wire initiation, and allows inference of Ldot voltage due to the implosion, in a manner similar to the work of Cuneo et al, Phys. Plasmas 11, 2009 (2004).

¹This research was supported by the Stewardship Sciences Academic Alliances program of the National Nuclear Security Administration under DOE Cooperative agreement DE-FC03-02NA00057.

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Date submitted: 27 Sep 2005

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