

Abstract Submitted  
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**Wire Array Dynamics with Varied Current Risetime on COBRA<sup>1</sup>**

JOHN GREENLY, KATHERINE CHANDLER, DAVID CHALENSKI, JON DOUGLASS, DAVID HAMMER, BRUCE KUSSE, Cornell University, SERGEI PIKUZ, Cornell University and P.N. Lebedev Physical Institute, Russia, RYAN MCBRIDE, Cornell University, TATIANA SHELKOVENKO, Cornell University and P.N. Lebedev Physical Institute, Russia — The 1 MA COBRA accelerator is used to drive wire array loads with current risetimes from 95 to 220 ns. The dynamics of 8 x 12 micron Al arrays show a clearly different character when driven by the fast and slow current pulses. The fast ( $\sim 100$  ns, 1 MA) drive produces a hot pinch, high total x-ray energy in a long-duration, slowly rising x-ray pulse, multiple hot spots in the pinch, a relatively small load voltage that stays up after x-ray peak, and a large inferred current radius at x-ray peak. In contrast, the slow ( $\sim 200$  ns, 900 kA drive) produces a cooler pinch with lower total x-ray energy in a short, fast-rising x-ray pulse, absence of hot spots but clear evidence of high-energy “electron beam,” large load voltage that drops fast after x-ray peak, and small inferred current radius at x-ray peak. The diagnostic evidence of these characteristics especially x-ray imaging and spectral information, will be presented and the dynamics underlying these phenomena will be discussed.

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