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Factors influencing the wire core and coronal plasma expansion in arrays with small numbers of wires¹ T.A. SHELKOVENKO, S.A. PIKUZ, J.D. DOUGLASS, I.C. BLESENER, P.W. ZYWICKI, J. SHIN, B.R. KUSSE, D.A. HAMMER, Cornell University, Ithaca, NY — The initial explosion phase of individual wires in a wire array may be a critical factor in the later development of the load impedance of the entire array. Factors influencing wire core and corona plasma expansion and long scale-length instability development in arrays with small numbers of wires (2-16) have been studied on the COBRA (1 MA current 100 ns risetime) and XP (500 kA current 45 ns risetime) generators at Cornell University using two frame point-projection x-ray backlighter imaging and three frame laser schlieren imaging and interferometry. The arrays were studied both as the main load of the generators and in the return current circuit. The dependence of the wire core and corona plasma development and expansion on the wire diameter, numbers of wires and current through the individual wires has been studied for Al and W wire arrays. As an example of our results we observe a nonlinear expansion of W wire cores with time.

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