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Investigation of Carbon Wire X-pinch backlighting for Pulsed Power Driven Exploding Wire Experiments SEAN MCGRAW, Ashland University, SIMON BOTT, FARHAT BEG, University of California San Diego — Exploding wire experiments have many important applications, including inertial confinement fusion research and laboratory astrophysical plasmas. Understanding of the dynamics of wire arrays is crucial to these applications. Details of wire ablation remain somewhat unclear, which lead to uncertainties in scaling to higher drive currents. The ablated coronal plasma is typically investigated using x-rays in the 3-5 keV range, however much of this plasma is highly transparent to this radiation, and information about the dynamics of coronal plasma above $10^{19}/\text{cc}$ is therefore lacking. A possible candidate for lower energy radiography is the carbon x-pinch, which produces x-rays below 1 keV. Experiments are conducted on GenASIS, a linear transformer driver, to study carbon x-pinch for wire array x-ray backlighting. This pulsed power system drives 250 kA into a short circuit and 200 kA into an x-pinch load. X-pinch formed from 20 μm titanium and 10 μm stainless steel wires are compared to the carbon system to provide more insight into the evolution and structure of exploding wires. Information from these comparisons will feed directly into the ongoing discussion of wire ablation at high currents.

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