Ablated Wire Material and Coronal Structure Interactions

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University of California San Diego — Results are presented from experiments studying the mass ablation, propagation, and jet development exhibited in pulsed power experiments. Jets were formed from x-pinches and low wire number conical wire arrays. They were observed to form between the electrodes and propagating above the anode. All results were obtained on a compact pulsar having a maximum current of 80 kA with a rise-time of 50ns. Optical probing diagnostics included side on interferometry, shadowgraphy, and schlieren imaging. Time gated x-ray images were recorded simultaneously to trace the emission profile. Several wire materials, including aluminum, tungsten, and stainless steel, were investigated to determine the effect of radiation cooling. Jet parameters such as velocity, density, and temperature were investigated, along with dimensionless parameters to assess scalability to astro-physical regimes. Laboratory scale plasma jet interaction with side winds will be attempted.

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