

Abstract Submitted
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New pulse forming network power supply for the Caltech Spheromak Formation Experiment¹ A.L. MOSER, P.M. BELLAN, Caltech — Past experiments on the Caltech Spheromak Formation Experiment produced plasmas with a 120 μF capacitor bank charged to 4–7 kV and supplying a 150 kA peak current with a FWHM of $\sim 10 \mu\text{s}$. We recently completed construction of a pulse forming network (PFN) having two parallel sections of five 120 μF capacitors, designed to produce a 150 kA peak current pulse with FWHM of $\sim 50 \mu\text{s}$. Preliminary experiments using only the PFN show the effect of the five-fold increase in current pulse length on the collimated jet precursor to spheromak formation: the jet extends to 55 cm, a length ~ 1.5 times that previously seen, and can develop two visible twists upon onset of the kink instability. Future experiments will use the 120 μF capacitor bank for plasma breakdown and the PFN for sustainment. A recently constructed capacitively coupled probe and axial 60-channel magnetic probe array will be used to study critical ionization velocity limited collisions between the magnetized jet and a neutral target gas cloud.

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