

Abstract Submitted
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Spheromak Buildup in SSPX using a Modular Capacitor Bank¹

R.D. WOOD, D.N. HILL, E.B. HOOPER, H.S. MCLEAN, C.A. ROMERO-TALAMÁS — The Sustained Spheromak Physics eXperiment uses DC coaxial helicity injection to produce plasmas with central $T_e > 350\text{eV}$ and $\beta_e \sim 5\%$ with toroidal fields of 0.6T. We report here results from experiments using a new solid-state programmable modular capacitor bank that allows higher peak injection currents ($> 600\text{kA}$), longer injection-current flattop ($> 8\text{ms}$), and multiple current pulses (5) for step-wise buildup experiments. The increased flexibility allows study of the physics of magnetic field generation, which is key to development of the spheromak as a magnetic fusion concept. Experiments using the modular capacitor bank have produced discharges (long formation) with the highest edge poloidal fields measured on SSPX and multiple current pulse discharges that continue to build magnetic field in a stepwise manner. The design of the programmable bank and results from using the bank to increase the magnetic field in SSPX will be presented.

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