

Abstract Submitted
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Spheromak merging studies in an oblate flux conserver in SSX¹

M.R. BROWN, C.D. COTHRAN, D.H. COHEN, V. CHAPLIN, A.M. PHILLIPS, L.D. BOOKMAN, T. GRAY, M.J. SCHAFFER, Swarthmore College — Work is underway on a new oblate flux conserver for spheromak merging studies on SSX. The oblate flux conserver has a 0.5 m inside diameter and $L = 0.28$ m with a 6 mm copper wall. The outer electrodes mate to the flux conserver through a conical entrance region. The entire inner surface will be coated with tungsten. Initial studies will be performed with arrays of magnetic probes and ion Doppler spectroscopy (IDS). Fast magnetic probe arrays in quartz jackets with resolution of 1 mm will be installed for magnetic reconnection studies at the midplane. Low spatial resolution magnetic probes will map the equilibrium structure. The SSX IDS instrument measures with 1 μ s or better time resolution the width and Doppler shift of either the nascent C_{III} impurity 229.7 nm line or a doped He_{II} impurity 468.6 nm line to determine the temperature and line-averaged flow velocity. Preliminary data will be compared with earlier merging results in a 0.4 m diameter, $L = 0.6$ m length prolate copper flux conserver in SSX. In prior merging studies we have measured $T_i \geq 50$ eV and $T_e \geq 30$ eV after all plasma facing surfaces are cleaned with helium glow discharge conditioning. Transient electron heating is measured with a 4-channel soft x-ray array and a 0.2 m vacuum ultraviolet spectrometer (C_{III} 97.7 nm/ C_{IV} 155 nm line ratio).

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