

Abstract Submitted  
for the DPP05 Meeting of  
The American Physical Society

**Spectroscopic Measurements of Flow and Ion Temperature at SSX** J. FUNG, S.C. CHANG, J. HORWITZ, B. COELLNER, C.D. COTHRAN, M.R. BROWN, Swarthmore College, M.J. SCHAFFER, GA — The Swarthmore Spheromak Experiment (SSX) studies magnetic reconnection by merging co- and counter-helicity spheromaks. Typical plasma parameters include electron density  $n_e \sim 10^{15} \text{ cm}^{-3}$ , temperature  $T_i + T_e \sim 30 \text{ eV}$ , and magnetic fields  $|B| \sim 0.1 \text{ T}$ . We present data from a new ion doppler spectroscopy (IDS) diagnostic. Our IDS system features a 1.33 m Czerny-Turner spectrometer with a 316 grooves/mm echelle grating and a 32-channel photomultiplier tube array. On any shot, we can observe any of 10 different chords through the plasma with submicrosecond time resolution and an instrument temperature  $\sim 6 \text{ eV}$ . Current studies have focused on the evolution of the CIII 229.7 nm line which we observe at 25<sup>th</sup> order, with dispersion 0.008 mm/nm using magnifying exit optics. Analysis to determine radial and toroidal velocities, as well as ion temperatures, via Abel inversion is underway. Preliminary results suggest near-Alfvénic bi-directional flows due to reconnection.

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Date submitted: 22 Jul 2005

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