Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Fluctuation and turbulence studies in the SSX plasma wind tunnel[1] K. FLANAGAN, T. GRAY, M.R. BROWN, Swarthmore College — Fluctuations and turbulence in the SSX plasma wind tunnel are examined by means of two high resolution (16 positions at 0.46 cm spacing) radial magnetic probes and one lower resolution (19 positions at 4.8 cm spacing) axial probe. The SSX wind tunnel is a copper 10:1 flux conserver with dimensions $L \cong 1\ m$ and $R = 0.08\ m$. Plasmas in this wind tunnel typically have densities on the order of $1 - 5 \times 10^{15}\ cm^{-3}$ and flow speeds of 50 km/s. Auto- and cross-correlation analysis of the axial probe data showed a spatial periodicity of 0.2 m. Initial results from one of the radial probes shows a temporal periodicity in the spatial auto- correlation that is suspected to be indicative of azimuthal rotation. Comparisons between the two radial probes at different azimuthal locations are underway to explore the effect of this rotation on radial correlation measurements. In addition to magnetic turbulence studies, high frequency fluctuations are measured with a He-Ne interferometer and a four-filter soft x-ray detector which both have sampling rates of 100 MHz. Preliminary results show fluctuations in the line averaged density at 1.5, 15, and 35 MHz.

[1]Work supported by US DOE and CMSO.

Michael Brown
Swarthmore College

Date submitted: 07 Jul 2011 Electronic form version 1.4