Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Measuring and Predicting the Flow Velocity in the HSX Stellarator[1] A. BRIESEMEISTER, K. ZHAI, J. RADDER, D.T. ANDERSON, F.S.B. ANDERSON, J.N. TALMADGE, HSX Plasma Lab, University of Wisconsin, Madison — Charge exchange recombination spectroscopy is used to measure the ion flow in HSX. The flow velocity measured at several radial locations increases when the electron temperature and temperature gradient are increased by increasing the electron cyclotron resonance heating power or changing the deposition location. Similar increases are predicted in the neoclassical radial electric field and the net parallel flow velocity profiles calculated using the PENTA code [1]. In order to quantitatively compare the calculated and measured values, a synthetic diagnostic has been developed to calculate the relationship between the neoclassically predicted values, the fully 3D flow (including the Pfirsch-Schlüter velocity) and the measured flows. A comparison between the ECRH driven electron flux calculated using the GNET code [2] and the neoclassical flux will be presented to show the effects this flux will have on the predicted radial electric field.

[1] J. Lore et al, Phys. Plasma 17 (2010) 056101.
[2] Murakami et al, Nucl. Fusion 40 (2000) 6930.

[1]Supported under DOE Grant DE-FG02-93ER54222.

A. Briesemeister
HSX Plasma Lab, University of Wisconsin, Madison

Date submitted: 14 Jul 2011 Electronic form version 1.4