

Abstract Submitted  
for the DPP17 Meeting of  
The American Physical Society

**Recent Results from HSX and New Directions**<sup>1</sup> DAVID ANDERSON, HSX TEAM, University of Wisconsin-Madison — HSX has demonstrated many improvements resulting from quasi-helical symmetry in the magnetic field. Work has continued on measuring the plasma radial electric field and bootstrap current utilizing the Pfrisch-Schluter flows, with a new MSE diagnostic under development. With suppressed neoclassical transport, turbulent transport is dominant in HSX. Experimental measurements of turbulence have been undertaken with probes in the edge and interferometry in the core. GENE has shown TEM to be dominant mode with heat flux comparable to measurements. No profile stiffness is observed under present conditions. These studies are being extended to look at comparisons between heat flux and density fluctuations as a function of gradient scale length. A new microwave scattering diagnostic and CECE are being implemented. Laser blow-off impurity studies are underway. Energetic ion confinement, a key issue for stellarators, will be studied using NBI of energetic deuterons into a deuterium plasma as done in MST and CHS. Improved coil design is being examined using the REGCOIL and FOCUS codes, with a goal of reduced ripple and coil complexity for either an upgrade to HSX or a new device to extend quasisymmetry studies into hot ion physics

<sup>1</sup>Work supported by the US DOE under grant DE-FG02-93ER54222

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Date submitted: 14 Jul 2017

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