

Abstract Submitted
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Measurements of Reynolds stress flow drive in the HSX stellarator¹ R.S. WILCOX, D.T. ANDERSON, J.N. TALMADGE, F.S.B. ANDERSON, HSX Plasma Lab, University of Wisconsin, Madison — The radial electric field has been measured using Langmuir probes and is found to deviate from its neoclassically predicted value in the HSX stellarator. HSX has been optimized for quasi-helical symmetry, which has the effect of reducing the neoclassical non-ambipolar particle losses which dominate the determination of the radial electric field in unoptimized stellarators. When the neoclassical transport is sufficiently reduced, other processes, such as the Reynolds stress, may also be important in determining the rotation. The Reynolds stress has been measured using floating potential signals to estimate the poloidal and radial velocity fluctuations. Based on these measurements and some estimate of the viscosity, the resultant flow drive from the measured Reynolds stress is shown to correspond qualitatively to the deviation in the measured radial electric field value from the neoclassical calculation.

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