

Abstract Submitted
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Progress in understanding flows and electric field in HSX¹ S.T.A. KUMAR, J. SMONIEWSKI, T. DOBBINS, J.N. TALMADGE, F.S.B. ANDERSON, D.T. ANDERSON, UW-Madison — Experimental measurements of the radial electric field in HSX could not reproduce the high positive values calculated with a neoclassical model. Several approaches to improve the measurement and modeling are being undertaken to understand this discrepancy. In particular: (a) The CHERS system on HSX has recently been modified to measure the counter-streaming Pfirsch-Schlüter (PS) parallel ion flows that could provide an improved measurement of the radial electric field in the plasma. Preliminary measurements indicate a larger radial electric field than the previous measurements, but still significantly less than the neoclassical values. (b) We are complementing the improvements in the experiment with improvements in the neoclassical modeling. We are using SFINCS and FORTEC-3D to validate the monoenergetic approximation used in DKES and PENTA codes. (c) A biased electrode is being used to observe the ion resonance with the electric field which would appear as a sudden drop in the biased electrode current and a sudden increase in the parallel flow. (d) Work is progressing on utilizing a complementary approach to measure the radial electric field due to the Motional Stark Effect (MSE).

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S. T. A. Kumar
UW-Madison

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