

Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Neoclassical calculations of radial electric field and plasma flow in HSX beyond the monoenergetic assumption¹ J. SMONIEWSKI, J.N. TALMADGE, S.T.A. KUMAR, HSX Plasma Lab, University of Wisconsin, S. SATAKE, NIFS, M. LANDREMAN, University of Maryland — The radial electric field in the plasma core has been measured to be in the range of 2-5 kV/m during ECRH. The measured value is in good agreement with the ion root electric field calculated using the neoclassical code PENTA. However, PENTA also calculates that there should be a large electron root very close to the axis on the order of 30-50 kV/m. To date, no evidence of this electric field has been found. The PENTA code is a momentum conserving extension of the DKES code. The underlying DKES code makes a monoenergetic approximation which is known to break down when the electric field is near resonant values. We present electric field and plasma flow results from the SFINCS and FORTEC-3D codes, neither of which make the monoenergetic assumption, to benchmark the PENTA calculations. SFINCS is a drift-kinetic continuum code, and FORTEC-3D is a Monte Carlo code that also retains radial coupling. Initial results appear to show little difference between the three codes for HSX relevant parameters. In addition, we present recent results from bias probe experiments.

¹Supported by US DoE award DE-FG02-93ER54222.

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Date submitted: 11 Jul 2014

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