

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Measurements of Edge Plasma Properties in the HSX Stellarator with Comparison to EMC3-EIRENE A.R. AKERSON, A. BADER, O. SCHMITZ, F.S.B. ANDERSON, C.C. HEGNA, D.T. ANDERSON, University of Wisconsin, Madison — 2D profiles of plasma edge temperature, density and flow have been obtained in the edge of the Helical Symmetric Experiment (HSX) using a multi-pin Langmuir probe. Comparison of these profiles with a 3D edge fluid and kinetic neutral transport model (EMC3-EIRENE) show significant deviations. In particular, measurements show peaked density and potential profiles within an edge magnetic island. These features appear coincident with a bundle of closed field lines according to Biot-Savart calculations, suggesting a link between transport and topology. Measurements of the plasma response to changes in edge field-line connection length with the use of a limiter are presented. These observations are important because the presence of potential structures and corresponding ExB flows are not included in the EMC3-EIRENE modeling, necessitating further investigation to understand the origin and impact that these structures have on edge plasma properties. This work supported by US DOE Grant DE-FG02-93ER54222

Adrian Akerson
University of Wisconsin, Madison

Date submitted: 24 Jul 2015

Electronic form version 1.4