

Abstract Submitted
for the DPP15 Meeting of
The American Physical Society

Neutral source and particle balance in the HSX edge¹ LAURIE STEPHEY, SANTHOSH KUMAR, AARON BADER, ADRIAN AKERSON, OLIVER SCHMITZ, DAVID ANDERSON, SIMON A, JOSEPH TALMADGE, CHRIS HEGNA, Univ of Wisconsin, Madison — The ability to control the neutral particle and impurity source in fusion devices is critical to obtaining high purity, high confinement plasmas. The neutral particle source defines the edge density gradients and plasma flows. To understand the relationship between the neutral particle source, plasma density gradients and plasma edge and core transport in HSX, a single reservoir particle balance is being used to provide a complete particle inventory. Detailed spectroscopic measurements of hydrogen and helium emission have yielded neutral and plasma profiles and ionization length estimations. The plasma puff source rate has been directly measured. To determine the recycling source rate, two specially designed limiters will be inserted to intercept 99% of the field lines, resulting in a well-defined LCFS and plasma interaction zone. Single limiter insertion resulted in a 50% reduction in global line emission, implying a reduction in wall recycling. Future camera and probe measurements will provide a recycling source rate. HSX neutral physics is also being investigated using EMC3-EIRENE. All results are discussed along with complementary plans for the Wendelstein 7-X startup phase.

¹This work supported by US DOE Grant DE-FG02-93ER54222 and DE-SC0006103.

Simon Anderson
Univ of Wisconsin, Madison

Date submitted: 24 Jul 2015

Electronic form version 1.4