Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

Determination of Sheath Heat Transmission Coefficient in NSTX Discharges with Applied Lithium Coatings[1] J. KALLMAN, M.A. JAWORSKI, R. KAITA, H. KUGEL, PPPL, A. MCLEAN, ORNL, V. SURLA, UIUC — Recycled particle flux can be a significant contributor to tokamak edge plasma density, and lead to reductions in edge temperature. Previous measurements have shown that lithium PFC coatings can lead to lowered edge recycling, corresponding decreases in edge plasma density, and a radial broadening of the electron temperature profile. During the 2010 run campaign, The National Spherical Torus Experiment operated with both solid and liquid lithium coatings on its plasma-facing components. A 99-tip dense Langmuir probe array was installed in the NSTX outboard divertor to measure scrape-off layer density and temperature. A dual-band fast IR camera was also installed to provide surface temperature and heat flux measurements. The present study compares the derived heat fluxes from these diagnostics to determine the sheath heat transmission coefficient γ. The value of γ was measured to be 2.49 +/- 0.04, smaller than the expected classical result of $\sim$7. Implications and possible mechanisms will be discussed.

[1]Supported by US-DOE Contracts DE-AC02-09CH11466 and DE-AC05-00OR22725.

Joshua Kallman
PPPL

Date submitted: 15 Jul 2011 Electronic form version 1.4