Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Surface characterization and local recycling measurement for evaporative lithium coatings on LTX-β[1] A. MAAN, University of Tennessee, E. OSTROWSKI, Princeton University, R. KAITA, D. DONOVAN, University of Tennessee, D.P. BOYLE, P.E. HUGHES, R. MAJESKI, E. MERINO, Princeton Plasma Physics Laboratory, F. SCOTTI, V. SOUKHANOVSKII, Lawrence Livermore National Laboratory, B.E. KOEL, Princeton University, T.M. BIEWER, D.B. ELLIOTT, Oak Ridge National Laboratory, C. HANSEN, University of Washington — Evaporative coatings on LTX and LTX-β have been used to improve plasma performance, including higher confinement times and flat temperature profiles. This has been attributed to a reduced recycling boundary, which retains a high fraction of incoming hydrogen. LTX-β recently employed a vacuum suitcase called the Sample Exposure Probe (SEP), to transfer samples of plasma-facing components (PFCs) under vacuum after plasma exposure to an analysis station for X-Ray Photoelectron Spectroscopy (XPS). The XPS indicates that the lithium coatings on PFCs oxidize to form Li2O as well as LiOH. It was initially hypothesized that elemental lithium is needed to provide a low recycling boundary by retaining incoming hydrogen as LiH. It appears, however, that a low recycling boundary is possible even in the presence of oxidized lithium. Using Langmuir probe and filterscope data to estimate the recycling, we correlate how it varies with surface lithium species as identified through analysis of PFC samples.

[1]This work supported by US DOE contracts DE-AC02-09CH11466, DE-AC05-00OR22725, and DE-AC52-07NA27344.

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Date submitted: 03 Jul 2019 Electronic form version 1.4