Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Post-mortem depth-profile analysis of graphite tiles in NSTX-U and comparison to day-to-day XPS data from MAPP[1] HANNA SCHAMIS, HEATHER SANDEFUR, University of Illinois at Urbana-Champaign, JEAN PAUL ALLAIN, Pennsylvania State University, FELIPE BEDOYA, Massachusetts Institute of Technology, ROBERT KAITA, University of Tennessee Knoxville — Graphite tiles from four different regions of NSTX-U (center stack, lower inboard divertor, lower outboard divertor, and upper divertor) were removed and cored after the 2015-2016 experimental campaign. These cored samples were analyzed at the IGNIS facility at UIUC using x-ray photoelectron spectroscopy (XPS) depth profile, and are shown to contain between 10 and 25% at.% boron. The uneven spatial distribution of boron concentrations within the tokamak suggest a nonuniform distribution of boron deposition during boronization and/or of boron erosion and redeposition during operations. In addition, ATJ graphite samples were inserted into the machine and studied with the Material Analysis and Particle Probe (MAPP). MAPP is a plasma facing component (PFC) diagnostic that was commissioned during the 2015-2016 NSTX-U experimental campaign. It has the capability of studying materials using XPS and other techniques without exposing the samples to atmospheric conditions. The first MAPP results have shown what occurs to boron layers on graphite and molybdenum surfaces on a day-to-day basis when exposed to NSTX-U plasmas.

[1]Work supported by US DOE Contract No. DE-AC02-09CH11466 and US DOE Contract No. DE- SC0010717.

Hanna Schamis
University of Illinois at Urbana-Champaign

Date submitted: 03 Jul 2019 Electronic form version 1.4