Abstract Submitted
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Advances in boronization on NSTX-Upgrade[1] C.H. SKINNER, W. BLANCHARD, D. CAI, M. JAWORSKI, PPPL, F. BEDOYA, J.P. ALLAIN, University of Illinois, F. SCOTTI, LLNL, B.E. KOEL, Princeton University — Boronization has been effective in reducing plasma impurities and enabling access to higher density, higher confinement plasmas in many magnetic fusion devices. The National Spherical Torus eXperiment, NSTX, has recently undergone a major upgrade to NSTX-U in order to develop the physics basis for a ST-based Fusion Nuclear Science Facility (FNSF) with capability for double the toroidal field, plasma current, and NBI heating power and increased pulse duration from 1 - 1.5 s to 5 - 8 s. A new deuterated tri-methyl boron conditioning system was implemented together with a novel surface analysis diagnostic (MAPP). We report on the spatial distribution of the boron deposition versus discharge pressure, gas injection and electrode location. The oxygen concentration of the plasma facing surface was measured by in-vacuo XPS and increased both with plasma exposure and with exposure to trace residual gases. This increase was correlated with the rise of oxygen emission from the plasma. A dedicated experiment is planned to optimize the boronization process including XPS measurements of the plasma facing surface under specific plasma conditions. We will report on the results.

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C.H. Skinner
PPPL

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