

Abstract Submitted
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Plans for Conditioning Plasma-Facing Components at Initiation of NSTX-U Operations¹ R. KAITA, W. BLANCHARD, D. CAI, S. GERHARDT, M.A. JAWORSKI, M. LUCIA, S. ROSSI, C.H. SKINNER, PPPL, J.-P. ALLAIN, F. BEDOYA, U. of Illinois — The conditioning of plasma-facing components (PFCs) has been critical to the achievement of high performance plasmas in fusion devices. The NSTX-U PFCs will initially consist of graphite. Well-established PFC conditioning will be applied, including high temperature bakeout and glow discharge cleaning (GDC). As in NSTX, the center stack (CS) will be electrically isolated from the outer vacuum vessel in NSTX-U for coaxial helicity injection (CHI), and this also permits high currents to pass through the CS for baking. Other conditioning techniques are required to further reduce the dominant impurities, which are expected to be carbon and oxygen. Boronization will first be performed, where helium glow discharge cleaning (GDC) is followed by GDC with a mixture of 95% helium and 5% deuterated trimethyl boron (TMB), and another period of helium GDC. This is to be compared with lithiumization, where lithium vapor is evaporated directly on PFC surfaces. The effectiveness of both conditioning techniques has been inferred from plasma measurements subsequent to their application, but the link between them and actual PFC conditions has not been made. The new Materials Analysis and Particle Probe (MAPP) is intended to do this with in situ analysis of PFC samples exposed to NSTX-U plasmas.

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