

NSTX-U Weekly Report (November 11, 2016)

FY 2017, NSTX-U is in the maintenance and repair outage.

An article “Theory based scaling of edge turbulence and implications for the scrape-off layer width” by J. R. Myra (Lodestar), D. A. Russell (Lodestar), and S. J. Zweben (PPPL) has just been published in Physics of Plasmas **23**, 112502 (2016), available online at <http://dx.doi.org/10.1063/1.4966564> . Length scales, time scales and dimensionless parameters between Ohmic, L and H modes using the NSTX edge turbulence GPI database were compared with theoretical estimates. Dimensionless parameters characterizing the drift-interchange turbulence were obtained and employed to assess the importance of turbulence in setting the scrape-off layer heat flux width and its scaling, in comparison to the total modeled cross-field transport. The analysis suggests that turbulence was not negligible in determining the heat flux width in NSTX, at least for discharges with high plasma current, where the heat flux width is smallest. (J.R. Myra)

R. Kaita (PPPL) gave a talk entitled “Suppressed gross erosion of high--temperature lithium via rapid deuterium implantation“ at the 2016 Japan-U.S. Workshop on Heat Removal and Plasma Material Interactions for Fusion, Fusion High Power Density Components and Systems and IEA Workshop on Solid Surface Plasma Facing Components at University of California at Berkeley on November 7, 2016. It included studies of the erosion of lithium coatings on TZM molybdenum plasma-facing components, performed by T. Abrams and M. Jaworski of PPPL and collaborators from the Dutch Institute For Fundamental Energy Research on the Magnum-PSI linear plasma device. Projections based on their results for lifetimes of lithium coatings in the NSTX-U divertor were also presented. (R. Kaita)

Jon Menard (PPPL) traveled to the University of California Berkeley on November 7, 2016 to present "Progress and plans for NSTX Upgrade and prospects for next-step spherical tori" to the student branch of the American Nuclear Society in the Department of Nuclear Engineering (J. Menard).

Engineering Operations (A. von Halle, P. Titus)

Preparations for the removal of the NSTX-U Center-stack continued this past week with the completion of activities associated with the upcoming lifts and removals of the upper ceramic break and the center-stack itself. All In-vessel preparations for the upper ceramic break and center-stack removals have been completed, and procedures, lift fixtures and rigging are in the final stages of review/inspections. The upper ceramic break is scheduled to be removed on Monday, and the center-stack will be removed on Tuesday/Wednesday. Recommissioning of the coil winding facility continued with work on the second taping machine, the vacuum molds and VPI system leak checking. Also this week, all repairs and hydrostatic testing of the neutral beam (NB) #2 calorimeter were completed, and repairs of the NB#1 calorimeter were started. The NB liquid helium refrigerator cold box shell has been lowered to provide access for inspections and telemetry repairs. A successful peer review of plans for stand-alone power testing of PF inner coils was held. Chit resolution is in progress.

Access to the NSTX-U Test Cell will be restricted during the upper ceramic break and center-stack lift activities.