

NSTX-U Weekly Report (November 4, 2016)

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

NSTX-U physicists attended the 58th Annual APS Div. of Plasma Physics Meeting in Sand Jose, Cal., Oct. 31-Nov. 4 2016. NSTX(-U) physicists gave four Invited talks: "A plasma rotation control scheme for NSTX and NSTX-U" by I. Goumiri (PU), "Plasmoids formation in a laboratory and large-volume flux closure during simulations of Coaxial Helicity Injection in NSTX-U" by F. Ebrahimi (PPPL/PU), "Impact of physics and technology innovations on compact tokamak fusion pilot plants" by J. Menard (PPPL) and "Resistive Wall Mode Stability Forecasting in NSTX and NSTX-U" by J. Berkery (Columbia University). In addition, NSTX(-U) gave 12 contributed oral and over 50 poster presentations. NSTX-U physicists also participated in ancillary meetings, including those of the Edge Coordinating Comm., U.S. TTF Steering and Executive Committees, Fusion Facilities Coordinating Comm. and the TRANSP User's Group. (S. Kaye, PPPL)

The paper "Initial operation of the NSTX-U Real-Time Velocity diagnostic" by M. Podestà and R. E. Bell of PPPL has been published online in Plasma Physics and Controlled Fusion (<http://dx.doi.org/10.1088/0741-3335/58/12/125016>). The paper describes initial results obtained by the RTV system from NSTX-U plasmas during the FY-16 experimental campaign. The RTV system has been designed to supply plasma velocity - and, possibly, ion temperature - data in real time to the NSTX-U Plasma Control System (PCS), as required for the implementation of toroidal rotation control. Measurements are available from four radii at a maximum sampling frequency of 5 kHz. Post-discharge analysis of RTV data provides information on ion temperature, toroidal velocity and density of carbon impurities that complements results obtained with the CHERS system. Examples of physics studies enabled by RTV measurements from initial operations of NSTX-U, including the effects of sawteeth and MHD instabilities on the dynamics of toroidal rotation, are also discussed in the paper. (M. Podestà)

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 work outside the vessel. Work has resumed inside the vessel with re-positioning of in-vessel tiles. Activities are currently on track to lift out the center-stack during the week Nov.14th. The Phase I forensic testing of the PF1aU coil segments has been completed, and a presentation of test data has been made. A report is being generated, and will include recommendations for additional actions. Work also continued on the recommissioning of the coil winding facility this week with preparation of the vacuum molds and VPI system, a successful heat run of the curing oven, and the refurbishment of a second taping machine. Vacuum leak checking of the neutral beam (NB) #1 and #2 calorimeter assemblies continues after the successful alignment and testing of the NB#2 calorimeter drive assembly.

Access to the NSTX-U Test Cell is expected to be available for approved work this coming week.