

NSTX-U Weekly Report (June 3, 2016)

FY 2016 NSTX plasma operations

Operation Targets: Total – 18 run weeks

Completed: 8.95 run weeks and 940 plasma shots

Many NSTX-U team members participated in 22nd International Plasma-Surface Interactions Conference in Roma, Italy, May 30-June 3, 2016. M. Jaworski (PPPL) presented a review talk "Liquid metals as PFCs: progress and prospects." M. Reinke (ORNL) presented an invited talk, "Expanding the role of impurity spectroscopy for investigating the physics of high-Z dissipative divertors." J-W. Ahn (ORNL) presented a contributed oral, "Effect of pedestal stability regime on the behavior of ELM heat flux footprints in NSTX and DIII-D." In addition, F. Bedoya (UI-UC), A. Fil (PU), R. Goldston (PPPL), T. Gray (ORNL), E. Kolemen (PU), P. Krstic (SUNY), R. Lunsford (PPPL), R. Maingi (PPPL), J. Nichols (PPPL), R. Perkins (PPPL), F. Scotti (LLNL), C. Skinner (PPPL), V. Soukhanovskii (LLNL), D. Stotler (PPPL) and B Wirth (UTKnoxville) had poster presentations. In addition, Princeton U. was chosen as the site for the 23rd PSI meeting, tentatively scheduled for June 14-18, 2018. PPPL is the host institution, R. Maingi is the Local Organizing Committee Chair, and E. Kolemen is the Princeton University liaison. The hydrogen isotopes in fusion devices meeting, a satellite meeting to PSI, will be hosted by Prof. B. Wirth at UT-Knoxville, either just preceding or just following the PSI meeting. (R. Maingi)

Dr. Roddy Vann from the University of York in the UK visited PPPL on June 2 and 3. Dr. Vann leads the team that developed the Synthetic Aperture Microwave Imaging (SAMI) diagnostic, that was previously installed on MAST in the UK and is now installed and operating on NSTX-U. The SAMI diagnostic can image mode-converted electron Bernstein wave emission and perform 2-D Doppler backscattering. Both techniques allow the measurement of the radial profile of the field pitch, and hence the current density, in the plasma edge. The diagnostic can also measure edge flows and turbulence characteristics. During his visit Dr. Vann presented a talk entitled "Measuring edge pitch angle using 2-D microwave Doppler backscattering on MAST and NSTX-U" and met with several members of the NSTX-U research staff. (G. Taylor, PPPL)

Experimental Plasma Operations (S. Gerhardt, R. Kaita)

The cabling for remotely controlling the insertion of the Lithium Evaporators (LITERs) and the Materials Analysis and Particle Probe (MAPP) into the NSTX-U vacuum vessel has been installed. The cable terminations are nearly complete, and testing can begin during the coming week. LITER use requires the Argon Purge System (APS) to be enabled. The elements of the Torus Vacuum Pumping System (TVPS) that control the APS have been tested, and the system is now operational.

The major components of the Far-infrared Tangential Interferometer/Polarimeter (FIRETIP) system were received at PPPL from the University of California at Davis. They included the lasers, detectors, and optics for steering the beam into the NSTX-U vacuum vessel. Installation of the electrical utilities for the FIRETIP laser enclosure ("cage") outside the NSTX-U Test Cell is almost complete, and the laser power supply and chiller have been moved there.

The new Langmuir probe electronics chassis installations have been completed. The new Langmuir probe arrays for the upper and lower NSTX-U outboard divertors are now instrumented.

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

NSTX-U is in a maintenance period to address a deformation discovered on a connecting flag on a PF1A coil lead, and to continue several previously scheduled test cell installations. A design is being prepared to provide additional bracing for the PF1A upper and lower water cooled flex bus. Dye penetrant tests indicate no cracking in the deformed flag, and bracing schemes have been fit up. Analysis in progress and a final design review is being scheduled for this coming Thursday. In parallel with this work time was taken to condition the neutral beam ion sources, concentrating on the three NB#1 sources which are now conditioning at ~90kV. Dummy load testing of all six HHFW RF sources continued. Also this week, control cabling for both lithium evaporator probes (LITERs) was installed in the test cell, and the pre-operational testing of the new Argon Purge System was completed. The FIRETIP Diagnostic Lasers and hardware have been received from UC Davis, and electrical installations are in progress. The new Langmuir probe chassis installations are complete, and the final connections to the probes are being made.

Access to the NSTX-U Test cell will be available for approved work during this upcoming maintenance week.