

## **NSTX-U Weekly Report (May 1, 2015)**

### **NSTX-U is in the Upgrade Project outage in FY 2015**

The following NSTX-U scientists attended the US/EU TTF Workshop held in Salem, MA from 4/28-5/1, 2015 and gave the following presentations: Oral talks were “Non-perturbative critical gradient model for Alfvénic fast ion relaxation using HINST code” by Nikolai Gorelenkov (PPPL), “Validation of a new fast ion transport model for TRANSP” by Mario Podesta (PPPL), “Physical mechanisms setting the divertor heat-load width seen from the XGC1 gyro kinetic simulations” by Seung-Hoe Ku (PPPL), “Experimental studies of electron-scalar turbulence on NSTX and NSTX-U: present status and future plans” by Yang Ren (PPPL), and “Nailing down the bootstrap current physics in steep pedestal plasma from advanced numerical simulation” by Robert Hager (PPPL). Poster presentations were “Reduced model prediction of electron temperature profiles in microtearing-dominated NSTX plasmas” by S. Kaye (PPPL), “Distinct turbulence sources and confinement feature in spherical tokamak plasma regime” by W. Wang (PPPL), “Identifying distinct evolution patterns among ELMs on NSTX with unsupervised machine learning” by D. Smith (U. Wisconsin), “Variations in Edge and SOL Turbulence in NSTX” by S. Zweben (PPPL), “Theory-based interpretive analysis of the NSTX GPI database” by J. Myra (Lodestar), and “Electron density gradient stabilization of electron scale turbulence at NSTX” by J. Ruiz Ruiz (MIT). (S. Kaye)

Jon Menard (PPPL) attended the KSTAR PAC meeting held April 27-29, 2015 at the National Fusion Research Institute (NFRI) in Daejeon, South Korea. Following the PAC meeting, he gave a seminar presentation to NFRI/KSTAR scientists entitled “NSTX-U Research Highlights and Program Status and Plans” (J. Menard).

The NSTX-U Team Meeting was held on May 1, 2015 at PPPL. The NSTX-U team was updated on the recent electrical fault event in the upper OH cooling water outlet area and the associated repair plan. An updated schedule toward research operation and the research program plan were also discussed. The meeting material is available on the web at [http://nstx.pppl.gov/DragNDrop/NSTX\\_Meetings/Team\\_Meetings/2015/2015-05/](http://nstx.pppl.gov/DragNDrop/NSTX_Meetings/Team_Meetings/2015/2015-05/). (M. Ono and J. Menard, PPPL)

### **Experimental Research Operations (S. Gerhardt, R. Kaita)**

Installation of the Multi-Pulse Thomson Scattering (MPTS) laser beam exit flight tube is complete and it is under vacuum with all three beam turning mirror crosses and its internal components installed. (B. Stratton, PPPL)

The MAPP sample analysis chamber was successfully installed under the NSTX-U vacuum vessel. (R. Kaita, PPPL)

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

Recovery from an external arc fault at the Ohmic Heating (OH) coil terminals continued this past week. Disassembly/analysis of components in the upper umbrella has been completed, and the cleaning procedure is being performed. Electrical insulation tests (Meggers) of the OH coil and hydrostatic testing of the OH coil cooling paths will be completed by early next week. Vessel

magnetic sensors and Rogowski coils have been successfully tested. A PPPL committee has been appointed to review the OH coil fault and will meet on May 8th to develop a report on this event. Conditioning of all three ion sources on neutral beam #2 is in progress. Work also continues on post CD-4 capabilities needed for NSTX-U experimental operations. The three crosses and Laser Dump have been installed on the Multi-pulse Thompson Scattering (MPTS) exit flight tube. Work packages are being prepared for the installation of the Zeus, LoWeus, and MonaLisa spectrometers and for MAPP.

Access to the NSTX-U Test Cell is expected to be available this coming week. Access must be arranged through Work Permits approved by the D-Site Shift Supervisors.