

## **NSTX Weekly Report (Oct. 20, 2006)**

### **FY 2007 NSTX plasma operations**

**Planned: TBD**

**Completed: 0 weeks**

Fourteen NSTX presentations were made at the IAEA Fusion Energy Conference in Oct. 16 – 21, Chengdu, China. “Recent Physics Results from the National Spherical Torus Experiment”, an NSTX overview presentation, was made by J. E. Menard. Topical presentations were “High Beta Plasmas Using Applied Non-axisymmetric Fields in NSTX” by A. C. Sontag (Columbia University), “Confinement and Local Transport in the National Spherical Torus Experiment (NSTX)” by S. M. Kaye, “Interpretation of Mode Frequency Sweeping in JET and NSTX” by H. L. Berk (U. Texas), “Particle and Energy Transport in the SOL of DIII-D and NSTX” by J. A. Boedo (UCSD), “Progress on NSTX towards a stable steady state at low aspect ratio” by D. Gates, “Phase Spec Gradient Driven Discrete Compressional Alfvén Eigenmodes in Tokamaks: Simulations and Observations” by N. Gorelenkov, “Electron Bernstein Wave Studies: Emission and Absorption with Nonthermal Distributions; Current Drive; Delta-F Particle in Cell Simulations” by R. W. Harvey (CompX), “Dependence of pedestal structure on aspect ratio DIII-D/MAST/NSTX joint machine experiment “ by R. Maingi (ORNL), “Results from the CDX-U Lithium Wall and NSTX Lithium Pellet Experiments “ by R. Majeski, “Investigation of Collective Fast-ion Redistribution or Loss in NSTX “ by S. Medley, “Solenoid-free Plasma Start-up in NSTX using Transient CHI “ by R. Raman (U. of Washington), “Divertor heat flux reduction and detachment studies in NSTX” by V. Soukhanovskii (LLNL). A post deadline presentation “Resistive Wall Mode Active Stabilization in High Beta, Low Rotation Plasmas” was made by S. Sabbagh (Columbia University). The NSTX presentations were very well received at the conference.

### **Engineering Operations (A. von Halle, C. Neumeyer)**

The NSTX outage continued this past week with the completion of the upper secondary passive plates and tiles, and the final testing and continuity, isolation, and inductance measurements of the upper and lower flux loops. The new Poloidal CHERS diagnostic optical fibers have arrived and are being tested. Preparations are underway to install these fibers in flexible conduit for installation on NSTX. Preparations are also underway for machining at the side of the bay K port extension as needed to install the new Transmission Grating (TG) Imaging USXR Spectrometer diagnostic. A Final Design Review of an internal molybdenum heat shield for the neutral beam to torus duct was held this week and that upgrade will be implemented before the duct is reinstalled. Testing of the in-vessel thermocouple system is in progress and electricians have completed work on upgrades to the Switching Power Amplifier system and the EBW system. Dr. Richard Nygren from Sandia National Lab. visited PPPL this past week to discuss lithium divertor development for NSTX.

The test cell will remain in free (card reader) access through most of the coming week.

### **Research Operations (M. Bell)**

### Boundary Physics Operations (H. Kugel)

LPI preparations for the upcoming Run have been planned. Two major aspects of the LPI work plan are reliability and accommodations for particular user pellet requirements. (G. Gettelfinger)

### Diagnostic Operations (R. Kaita)

- A Preliminary Design Review for the installation of the Hypervelocity Dust/Plasma injector was held on Oct. 18, between LANL and PPPL. Attendees from LANL were Jeff Wang, Lenny Dorf, Catalin Ticos, and Glen Wurden. At PPPL, Lane Roquemore, George Labik, Mike Bell, Brent Stratton, Paul Sichta, and a few others. The intention was to better define the necessary interfaces between NSTX and the HDI system. Planned location is the Bay E midplane port, for the compact plasma/dust injector, which is undergoing operational testing at LANL. (G. Wurden, LANL)
- Peer reviews for three diagnostics-related hardware systems were held on Thursday, October 19. They involved a new gas feed line for the electron Bernstein wave (EBW) system, new antennas for the UCLA microwave horn array, and new high-frequency magnetic pickup (Mirnov) coils inside the NSTX vacuum vessel. No issues that would preclude any of these tasks were identified.
- The installation of a new electronics rack for the EBW system was completed.