

## **NSTX Weekly Report (Oct. 27, 2006)**

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

**Planned: TBD**

**Completed: 0 weeks**

• Members of the NSTX team attended the ITPA meetings in Chengdu, China, Oct. 23 – 25, 2006. In the Confinement Databases and Modeling group meeting, Stan Kaye made two presentations, “Condition of the H-mode database: low aspect ratio data” and “Recent confinement results from NSTX”. The material in the latter presentation was particularly appropriate for discussion, and it contained results from dimensionless parameter scans in beta and nu-star (subjects of both a CDB and Transport ITPA high priority issue), as well as detailed scans isolating the BT and Ip dependences observed on NSTX. There was much interest in the results. R. Maingi (ORNL) presented two talks at the ITPA pedestal group meeting: "Structure of Small, Type V ELMs in NSTX" and "A progress report: dependence of the H-mode pedestal structure on aspect ratio (PEP-9)". In addition, he presented a talk on behalf of H. Meyer: "Progress report: comparison of small ELM regimes in MAST, NSTX, and C-MOD." Jon Menard attended the ITPA MHD group meeting and presented 3 talks at the meeting: "Error field identification and correction at high beta-N in NSTX", "Resistive Wall Mode (RWM) Passive and Active Stabilization in High Beta, Low Rotation Plasmas" (for S. Sabbagh, et al.), and "MHD induced current profile redistribution in NSTX" in the joint session on MHD in hybrid scenarios. B. Heidbrink gave a presentation on "Fast ion transport in DIII-D and NSTX", and N. Gorelenkov presented work for ITER entitled "Effect of safety factor profile on TAE stability in ITER". NSTX is anticipated to contribute (run-time permitting) to the following 3 joint MHD experiments in 2007: “Joint experiments on resistive wall mode physics; “ Neoclassical tearing mode physics - aspect ratio comparison”; and “Fast ion redistribution by beam driven Alfvén modes and excitation threshold for Alfvén cascades.” (S. Kaye, R. Maingi, and J. Menard)

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

The NSTX outage continued this past week with the completion of in-vessel work associated with the new Poloidal CHERS diagnostic. Electrical and communication systems for PCHERS are being installed in the diagnostic control room adjacent to the NSTX test cell, and the long optical fibers for this diagnostic are being installed in flexible conduits for installation on NSTX. The upper and lower vacuum flanges for this diagnostic are being prepared and tested. Also this week, in-situ machining at the side of the bay K port extension as needed to install the new Transmission Grating (TG) USXR Imaging Spectrometer diagnostic from Johns Hopkins University is underway. The mounting of new alignment blocks and replacement of bushings on the neutral beam calorimeter is proceeding, with reinstallation of the assembly scheduled for early November.

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

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

#### **Diagnostic Operations (R. Kaita)**

- Final approval for the modification of the Bay K port extension has been obtained. Machining has begun on a penetration on its side, to accommodate a “nipple” for the new Johns Hopkins University transmission grating X-ray spectrometer.
- There was a final design review on October 26, 2006 for changes to the neutral beam armor on the outer vacuum vessel wall. These are required to remove obstructions in the sightlines for two channels of the FIRETIP density profile diagnostic. The conclusion of the review was to proceed with the work, pending a final check of the actual armor itself to confirm the accessibility of the areas to be modified.
- Three new high-frequency Mirnov coils have been wound, and studs for them have been attached to the vacuum vessel wall. Since they are to be displaced toroidally from the existing coil set, the capability for MHD mode identification will be improved.