

NSTX Weekly Report (November 9, 2007)

FY 2008 NSTX plasma operations

Planned: TBD

Completed: 0 weeks

The National Spherical Torus Experiment (NSTX) Research Forum for 2008 is scheduled for November 27 - 29, 2007 at the Princeton Plasma Physics Laboratory in Princeton, NJ USA. Team members or prospective collaborators are invited to attend or participate remotely. The Research Forum is intended to provide interested researchers the opportunity to present ideas for experiments to be conducted on NSTX in the forthcoming run. Both well-developed and new ideas in the early stages of development are welcomed. A web site for the FY2008 NSTX Research Forum has been created. It can be accessed through a link on the NSTX Home Page or directly <http://nstx-forum-2008.pppl.gov>. Proposals for experiments to be performed in 2008 can be submitted for discussion at the Research Forum may be submitted through the website. Any problems with the website should be addressed to S. Kaye (skaye@pppl.gov). There are no registration fees for the meeting, but researchers from other institutions are asked to pre-register in order to participate. (M. Bell, S. Kaye)

The paper "Control of Asymmetric Magnetic Perturbations in Tokamaks" by Jong-kyu Park, Michael J. Schaffer, Jonathan E. Menard, and Allen H. Boozer has been published in Physical Review Letters (PRL 99, 195003 (2007)). This collaborative work between researchers at PPPL/NSTX, General Atomics/DIII-D, and Columbia University utilizes the newly developed Ideal Perturbed Equilibrium Code (IPEC) to improve understanding of the importance of the plasma response in tokamaks perturbed by 3D magnetic fields. In particular, (from the abstract) "DIII-D and NSTX experiments find that when the deleterious effects of asymmetries are mitigated, the external asymmetric field was often made stronger and had an increased interaction with the magnetic field of the unperturbed equilibrium. This Letter explains these counterintuitive results. The explanation using ideal perturbed equilibria has important implications for the control of field errors in all toroidal plasmas including ITER. (J. Menard)

Engineering Operations (A. von Halle, C. Neumeier)

The NSTX outage continued this past week with the completion of the in-vessel calibration of the PCHERS diagnostic, alignments of the MPTS system, and the assembly and fit-up of the new bolometer system. The TF coil system flexible bus links have been re-installed, and insulation tests (HiPots) as well as a 200 amp continuity check to check joint resistances were performed. The second neutral beam ion source was installed on the beam-line this week after the successful completion of pre-operational testing.

The NSTX test cell will be in unrestricted (card reader) access this coming week.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- The LLD reports "Liquid Lithium Divertor (LLD) Wetting Test Plan", and "Progress Report 6 Nov. 2007: Initial Work on Thermal Analysis of LLD Wetting Test" were received from R. Nygren (SNL) and are under review.

- A LITER 2008 shutter port was installed on the test chamber and preparations are in progress to leak check the assembly, to load the LITER probe with about 20 g of lithium, and to mount the probe on the test chamber in preparation for shutter testing.
- 3 Quartz Deposition Monitors (QDM) were installed on Bays H Upper and Lower, and on Bay I midplane. These units are operational and are acquiring data. (C. H. Skinner)

Diagnostic Upgrades (B. Stratten)

- P-CHERS: Alignment of the spectrometers is complete. Spatial and white-plate calibrations of the system have been completed. The work on the P-CHERS diagnostic that requires in-vessel access is done. Calibrations of the toroidal CHERS and Edge Rotation diagnostics were completed earlier this week. A spatial calibration of the FIDA diagnostic was performed at the same time as the P-CHERS spatial calibration.
- Divertor bolometer: The re-assembly of the Bay I system is complete following replacement of the magnetic shutter shafts. The system is now in the vacuum prep lab for cleaning. The location of the pinhole will be measured with the FARO arm when installation is complete.

Diagnostic Operations (R. Kaita)

- MPTS polarizer: Installation was completed earlier this week. Calibration is complete.
- MPTS calibration probe: the probe is installed on the machine and is being aligned. When alignment is complete, the probe will be exercised a number of times to ensure that it functions reproducibly. The fiber bundle is complete and is being cleaned and baked in the vacuum prep lab.