

NSTX Weekly Report (Feb. 20, 2009)

FY 2009 NSTX plasma operations

Planned: TBD

Completed: 0 run weeks

A paper entitled "Momentum transport in electron-dominated spherical torus plasmas" by S.M. Kaye et al. was accepted for publication in Nuclear Fusion. The paper examines the effect of rotation on plasma performance and also determines the details of momentum transport. The results clearly indicate that rotation shear can be used as a tool to control the ion thermal transport locally. Further, determinations of momentum pinch velocities and their comparisons to theory indicate that low-k turbulence controls momentum transport. (S. Kaye)

NSTX PAC Meeting (J. Menard)

The 2009 NSTX PAC meeting was held at PPPL from February 18-20. The PAC was chaired by Michael Mauel (Columbia), and the other committee members participating were Jim Van Dam (UT-Austin), Riccardo Betti (Rochester), Paul Bonoli (MIT), Jeffrey Brooks (Purdue), Ronald Cohen (LLNL), Xavier Garbet (CEA-Cadarache), Don Hillis (ORNL), Haruyuki Kimura (JAEA), Richard Majeski (PPPL), Hendrik Meyer (Culham-UK), John Sarff (UW-Madison), Mickey Wade (GA), and Steve Eckstrand (OFES, ex-officio).

The PAC was asked to provide advice on: (1) the balance and focus of the NSTX program for next-step ST development, ITER high-priority research needs, and fundamental toroidal confinement science, (2) utilization of the near-term (FY2009-2011) facility and diagnostic upgrades, and (3) responsiveness to the priorities identified in the FESAC-TAP report.

Presentations summarizing the FY2008 results, program and facility/diagnostic plan overviews, the FY2009 run plan, and topical science group results and plans were presented on February 18 and 19th and are archived at:

http://nstx.pppl.gov/DragNDrop/Program_PAC/PAC/PAC-25/Presentations/

The panel provided the NSTX research team with an initial debriefing on Friday morning and will provide a written report in the near future.

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

Initial NSTX plasma operations began this week after the successful completion of combined field power testing and magnetic diagnostics calibrations. Several days of plasma operations were performed to evaluate NSTX machine conditions, and utilized neutral beam injection to 90keV. During the off-hours, progress was made on the re-assembly of the external wave guides to the HHFW antennas, recently upgraded to provide balanced power feeds. The NSTX Test cell will be in restricted access this coming week during plasma operations. Limited access will be available after 5PM each evening..

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Liquid Lithium Divertor (LLD) (M. Viola)

A teleconference was held with SNL and PPPL to discuss LLD progress and planning:

SNL Status:

- 3 plates are brazed and machined; the remaining 3 are being brazed.
- The molybdenum coating requisition is awaiting resolution of budget issues.
- Assembly of the control rack is being documented with photos.
- Arrangement with cabling in wiring diagram will be performed within 2-3 weeks.
- A new schedule for control rack shows shipping April 15.

PPPL Status:

- A test plate is being machined; will be completed and sent out for step-bending next week.
- The D-site Assembly area (Upper DARM) is 90% complete and will be complete by the end of February.
- 3 hole plate and heater sent to vacuum lab for testing. Final preparations in progress to start pumpdown.

- Edge Sample Probe (C. H. Skinner)

- A teleconference was held with Purdue collaboration team to review work in progress.
- A prototype of the molybdenum sample holder was fabricated and discussed.
- Drawings for the final assembly are in progress.
- Planning and a tentative schedule for the Final Design Review were drafted.

- Lithium Powder Dropper (D. K. Mansfield)

- The enclosure for dropper-1 is under vacuum and being prepared for vacuum testing.
- The actuator parts have been tested and final assembly for testing prior to installation are in progress.

Diagnostic Operations (R. Kaita)

- The window calibration for the multipoint Thomson scattering (MPTS) diagnostic has been performed. Within the uncertainty in the measurement, the window transmission had not changed. The MPTS hardwired system interlock testing was also completed.