

NSTX Weekly Report (February 25, 2011)

FY 2011 NSTX plasma operations started on October 4, 2010

FY 2011 NSTX Outage started on October 25, 2010

Planned Run Weeks: TBD

Run Weeks Completed: 4.21 run weeks and 839 plasma shots

The National Spherical Torus Experiment (NSTX) Research Forum for 2011-12 is scheduled for March 15-18, 2011 at the Princeton Plasma Physics Laboratory in Princeton, NJ USA. Team members or prospective collaborators are invited to attend or to participate remotely. The Research Forum is intended to provide the opportunity to present ideas for experiments to be conducted on NSTX in the forthcoming run, and also for theoretical work supporting NSTX. Both well-developed and new ideas in the early stages of development are welcomed. For further details, please see: <http://nstx-forum-2011.pppl.gov/> Proposals for experiments to be performed in 2011-2012 can be submitted for discussion at the Research Forum through this website beginning March 7, 2011. You are encouraged to begin discussing ideas for proposals with the NSTX topical science group (TSG) leaders whose contact information is provided at: <http://nstx-forum-2011.pppl.gov/organization.html>. (J. Menard, Program Director)

The paper “Effect of Collisionality on Kinetic Stability of the Resistive Wall Mode” by J.W. Berkery (Columbia University), et al. was recently published in Physical Review Letters **106**, 075004 (2011). The paper illustrates the important new realization that the effect of collisions on RWM stability is not simply stabilizing, but depends on the degree of kinetic resonance effects in the plasma. This has a profound impact on the scaling of RWM stabilization to reduced collisionality plasmas such as ITER. (S. Sabbagh, Columbia University)

Steve Sabbagh presented a lecture for the NSTX research team at the 2011 KSTAR Conference entitled “RWM Stabilization and Active Control in NSTX”. (S. Sabbagh)

On February 14, R. Raman gave the talk “Overview of Physics Results from NSTX” at the University of Washington. (R. Raman, University of Washington)

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

The NSTX outage continued this past week with the installation of the Diagnostic Neutral Beam for the new MSE-LIF diagnostic, and the welding/leak checking of the first of two viewing ports for the new tFIDA diagnostic. Electricians have completed the installation of the second Switching Power Amplifier (SPA) supply for the machine's error field correction coils, and subsystem testing is in progress. Also this week, a calibration of the machine's neutron detectors was performed, and a peer review of plans to instrument some of the new molybdenum divertor tiles was held.

Access to the NSTX test cell will be available this coming week.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Liquid Lithium Divertor (LLD)
 - The machining to repair the first LLD plate was nearing completion.
 - The procedure for cleaning the LLD after machining was approved and preparations were made for cleaning the first plate.
- Lithium Evaporators (LITERs)
 - Heaters were purchased for the fabrication of new LITERs for the 2011–2 run.
 - Analysis was completed for locating the LITER oven thermocouples to facilitate lithium level monitoring.
- Lithium Granule Centrifuge for ELM Pacing
 - Lithium granules were received. Initial inspection indicated that the granules are in the range of 0.7 - 1.0 mm diameter, very spherical and flow quite freely. This indicates that they are suitable for use in the centrifuge.
 - A 28,000 RPM air motor was received and testing is in progress.
- Fast Gas Injectors for Disruption Studies
 - The assembly and leak testing of the components for the inner divertor assembly were completed.
- Materials Analysis Particle Probe (MAPP)
 - The Purchase Order for the Bellows Motion Drive was awarded.
- Molybdenum Inner Divertor
 - A Peer Review of the diagnostics for the molybdenum divertor surfaces was held. The recommended actions were:
 - 1) Convert all tiles in Row-1 of the lower inner divertor from graphite to molybdenum, and relocate all sensors presently in those graphite tiles to the molybdenum tiles
 - 2) Retain the present 99-probe Langmuir Array in the outer divertor as is.
 - 3) Install a TIV for the wide-angle IR camera before pumpdown.
 - 4) Complete installation of fast thermocouples at Bay H in the lower outer divertor before pumpdown.

Diagnostic Operations (R. Kaita)

A neutron calibration was performed from Friday evening, February 18, until Monday morning, February 21. M. Isobe from the National Institute for Fusion Science in Japan joined PPPL personnel in this effort. The setup involved a source that moved toroidally around the vacuum vessel at a single height and radial location. Sufficient counts were accumulated for a cross calibration of neutron detectors with different sensitivities.