

## NSTX Weekly Report (March 11, 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**

Anthony Field and Young-Chul Kim from MAST (Culham, United Kingdom) visited NSTX during the week of Feb. 28 to March 4. The purpose of their visit was to initiate collaboration with the Beam Emission Spectroscopy (BES) team on NSTX. Field and Kim have been working on the BES system on MAST, which will be available during their next run period. Field gave talks on the Status of MAST and the Status of the MAST-Upgrade, while Kim gave a talk detailing the analysis tool he has developed for analyzing BES data. They spoke with University of Wisconsin BES researchers, Dave Smith and George McKee, about being able to access one shot's worth of NSTX data to test out the analysis tool. (S. Kaye)

Mitsutaka Isobe and Hisamichi Funaba of the LHD research team at the National Institute for Fusion Science (Japan) visited NSTX as part of the US-Japan Collaboration. Mitsutaka Isobe visited NSTX to learn more about the neutron detectors used on NSTX and to observe the absolute calibration of the system with a neutron source mounted on a model train that traveled on a circular track inside the vacuum vessel continuously for 3 days. He learned about numerous issues that affect the potential accuracy of the calibration, including composition of the neutron source, constancy of the speed of the model train, scattering of neutrons from NSTX and its surroundings, as well as goals for the statistics of the calibration. He also assisted in tabulation and analysis of the measurements during the calibration. Dr. Isobe's observation of the NSTX calibration is part of an on-going PPPL-NIFS collaboration on energetic ion and fusion product physics and he is developing a proposal to calibrate neutron detectors on LHD using a similar method. Hisamichi Funaba investigated the applicability of the STRAHL code to metal impurity transport in the NIFS Large Helical Device (LHD) and NSTX. (D. Darrow, H. Kugel, PPPL)

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

The NSTX outage continued this past week with the reinstallation of the RF cages for the HHFW antennas, and the cutting of the vessel penetration for the second tFIDA diagnostic view. The installation of the second tFIDA window is in progress. Machining of all four Liquid lithium Divertor (LLD) plates to accept new mounting hardware has been completed, and plates have been cleaned in preparation for installation. Trial in-vessel fit-ups of the new LLD mounting hardware was performed this week, with plans to start the final plate installations next week. Also this week, reinstallation of piping for the neutral beam liquid helium refrigerator was completed.

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 maintenance machining of all 4 plates was completed.
  - The cleaning of all 4 plates was completed.
  - A trial installation of one plate is in progress.
  - Preparations for installing the thermocouples and fasteners in the plates started.
- Lithium Evaporators (LITERs)
  - Electrical measurements on the first 2 of 4 probes were completed to document post-run conditions and in preparation for their replacement with new units.
- Lithium Technology Development
  - The new Double Chamber Argon Glove Box was tested successfully with argon, and quickly achieved significantly low humidity levels, thereby qualifying it for lithium work.
- Lithium Centrifuge
  - The new Double Chamber Argon Glove Box was used to start the sorting of spherical lithium granules. This work is about 50% completed. Most of the granules have been found to range in diameter from 0.7 to 0.85 mm.
  - Work on a prototype impeller for centrifuge testing started and is about 50% completed.
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- Disruption Mitigation System
  - The installation of the lower dome Disruption Mitigation unit was completed.
  - Work is in progress on the mid-plane Disruption Mitigation unit.
- Molybdenum Inner Divertor
  - 24 molybdenum tiles (out of 96 ordered) were received, and receiving-inspection has started.
  - Drawings for the molybdenum sensor tiles for the thermocouple, Langmuir Probe, and Mirnov coil were completed.