

## NSTX Weekly Report (July 8, 2011)

**FY 2011 NSTX plasma operations started on October 4, 2010**

**FY 2011 NSTX Outage started on October 25, 2010**

**Planned Run Weeks: 14 run weeks**

**Run Weeks Completed: 4.21 run weeks and 839 plasma shots**

Members of NSTX research team attended the 38<sup>th</sup> European Physical Society Conference on Plasma Physics, June 27 - July 1, 2011, Strasbourg, France and presented the following contributed papers: "Effect of 3-D fields on divertor detachment and associated pedestal profiles in NSTX H-mode plasmas " by J-W. Ahn (ORNL), "Dependence of the LH power threshold on the X-point radius" by D. Battaglia (ORNL), "Resistive wall mode kinetic stability advancements for refined comparison with experiments" by J.W. Berkery (Columbia U), "Edge transport measurements with the new multi-energy SXR (ME-SXR) diagnostic on NSTX" by D. Clayton (JHU), "Internal Amplitude Measurements of CAE and GAE", E.D. Fredrickson (PPPL), "Heuristic drift-based model for the power scrape-off width in H-mode tokamaks" by R. Goldston (PPPL), "Nonlinear gyrokinetic simulations of microtearing mode turbulence" by W. Guttenfelder, "First order finite-orbit-width corrections in CQL3D ion Fokker-Planck modeling of the NSTX HHFW experiment" by R. Harvey, "Properties of HHFW electron heating generated H-modes in NSTX" by J. Hosea, "Impurity analysis using a space resolved transmission grating imaging spectrometer (TGIS) on NSTX" by D. Kumar (JHU), "Density Profile and Particle Transport Control as the Critical Ingredients for ELM Suppression in Tokamaks" by R. Maingi (ORNL), "Advances in resistive wall mode stabilization to maintain high beta, low internal inductance plasmas in NSTX" by S. Sabbagh (Columbia University), "The snowflake divertor: a game-changer for magnetic fusion devices?" by V. A. Soukhanovskii (LLNL), "Multi-energy SXR imaging diagnostics for fusion experiments" by D. Stutman (JHU), and "High-harmonic fast wave heating and current drive results for deuterium H-mode plasmas in the National Spherical Torus Experiment" by G. Taylor (PPPL).

The paper "Investigation of multiple roots of the resistive wall mode dispersion relation, including kinetic effects" by J.W. Berkery (Columbia University), et al. was published in PHYSICS OF PLASMAS 18, 072501 (2011). The paper investigates the characteristics of the RWM dispersion relation including kinetic effects, in light of potential RWM instability at significant levels of plasma rotation. The paper can be found online at this URL: [http://pop.aip.org/resource/1/phpaen/v18/i7/p072501\\_s1](http://pop.aip.org/resource/1/phpaen/v18/i7/p072501_s1). (S. Sabbagh, Columbia University)

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

Preparations for upcoming NSTX operations continued this week with the completion of the vacuum vessel bake and the replacement of the neutral beam ion source in the "A" position. Pre-operational testing of the new Switching Power Amplifier (SPA) system intended to allow individual control of the six Resistive Wall Mode Error Field Coils has been completed, and that system is now ready for integrated system power tests. Four 2011 version lithium evaporator (LITER) probes have been completed, and two are being prepared for installation on the NSTX vacuum vessel. Also this week, a full power test of the 2600kW standby diesel generator following exciter repairs was successfully completed, and the new HVAC system for the NSTX diagnostic Data Acquisition Room (DARM) was commissioned.

Access to the NSTX test cell will be restricted this coming week during machine area scrubs and field coil integrated system power testing. Access to the test cell is expected to be available during the 2nd shifts on Wednesday through Friday.

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

#### Boundary Physics Operations (H. Kugel)

- Lithium Evaporators (LITERs)
  - The fabrication of the four LITER 2011 units was completed. Work started mounting the first two units to their probe drives.
  
- Materials Analysis Particle Probe (MAPP)
  - Assembly and testing of the probe instrumentation rack was completed at Purdue, and preparations started for its shipment to NSTX starting on Monday 7/11/2011. Two Purdue graduate students will accompany the equipment to PPPL and then stay to work on its installation and calibration.
  
- Lithium Centrifugal Granule Injector for ELM Pacing
  - Work continued on procuring the parts and equipment.
  
- Quartz Deposition Monitors
  - Three deposition monitors have been repaired after damage incurred during a power outage and are now operating.

#### Diagnostic Operations (R. Kaita)

- The photometric calibration of the Visible Bremsstrahlung diagnostic has been completed.