

## **NSTX Weekly Report (June 30, 2006)**

**FY 2006 NSTX plasma operations completed on June 23, 2006.**

**Joule Milestone: 11 weeks**

**Achieved: 12.66 weeks**

A paper entitled "Active Stabilization of the Resistive Wall Mode in High Beta, Low Rotation Plasmas" by S.A. Sabbagh (Columbia University), R.E. Bell, J.E. Menard, et al., has been accepted for publication in Physical Review Letters. This paper documents the recent RWM active stabilization experiments in NSTX, which included stabilization of plasmas in which the plasma rotation was slowed by non-resonant  $n = 3$  magnetic braking, resulting in rotation profiles significantly below the RWM critical rotation profile and in the range expected for ITER. (S. Sabbagh)

Members of the NSTX Research Team from PPPL and collaborating institutions presented the following eight oral (1) and poster (7) contributions on NSTX research at the 33rd European Physical Society Conference on Plasma Physics held in Rome, Italy, 19 - 23 June 2006. "Observation of MHD-induced Current Redistribution in NSTX" by J. Menard. "Observation of Hole-Clump Pair Generation by Global or Compressional Alfvén Eigenmodes" by E.D. Fredrickson, "L-to-H power threshold comparisons between NBI and RF heated plasmas in the National Spherical Torus Experiment" by T.M. Biewer (MIT), "Solenoid-free Plasma Start-up in HIT-II and NSTX using Transient CHI" by B.A. Nelson (U. Washington), "New Capabilities and Results for the National Spherical Torus Experiment" by M.G. Bell, "Fueling experiments with supersonic gas jet in NSTX" by V.A. Soukhanovskii (LLNL), "Perturbative Studies Of Electron Transport In NSTX" by D. Stutman (Johns Hopkins U.), "Interpretation of EBW simulation and comparison with MAST and NSTX experiments" by J. Urban (Institute of Plasma Physics, Prague). E.J. Doyle of DIII-D/UCLA also presented an invited talk at the conference on "Progress on Advanced Tokamak and Steady-State Scenario Development on DIII-D and NSTX" which highlighted some of the recent progress on extending the pulse length in NSTX high-beta discharges through active control of error fields and MHD instabilities. The talks and posters attracted considerable interest from the approximately 600 physicists attending the conference. (M. Bell)

There will be no NSTX Physics meeting on Monday, July 3. (S. Kaye)

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

Post-run calibrations and other preparations for the NSTX vacuum vessel vent were performed this past week. A neon-glow wavelength calibration for CHERS was completed, followed by Rayleigh and Raman scattering calibrations of the MPTS diagnostic. A calibration of the CHI overvoltage protection systems was also performed via several test shots of that system's capacitor bank. The LITER cartridge has been withdrawn behind its TIV and vented with argon. Warm-up of the neutral beam cryogenic systems is complete, the warm helium process gas moved to the storage tanks, and the refrigerator secured for the outage. The NSTX vacuum vessel is scheduled to be vented on July 5th.

With the completion of power testing this week, the test cell is now in free (card reader) access around the clock.

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

### **Diagnostic Operations (R. Kaita)**

- The diagnostic calibrations to be performed prior to the venting of the NSTX vacuum vessel have been completed. A neon glow discharge was used to calibrate the CHERS ion temperature and velocity diagnostic. The vacuum vessel was then pressurized with nitrogen for Rayleigh and Raman scattering measurements to calibrate the multipoint Thomson scattering electron temperature and density profile diagnostic.
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