NSTX Weekly Report (October 14, 2011)

NSTX is in the Upgrade Project outage in FY 2012

The following NSTX papers were presented at the H-mode workshop: "L-H power threshold scaling with magnetic geometry on NSTX and the role of ion orbit loss" by D. Battaglia (PPPL), "Analysis of pedestal thermal transport and density fluctuations during the inter-ELM phase in NSTX" by A. Diallo (PPPL), "Analysis of Enhanced Pedestal H-mode on NSTX based on the Reynolds number of ion-neutral friction" by K.C. Lee (UC-Davis), "Characterization of the Enhanced Pedestal H-mode in NSTX" by R. Maingi (ORNL), and "Intrinsic rotation generation during L-H transitions in NSTX ohmic plasmas" by J-K Park (PPPL). In addition simulations of the NSTX H-mode pedestal with lithium wall coatings were presented in "H-mode pedestal turbulence of tokamak devices using the BOUT++ code" by X. Xu (LLNL). In addition, Diallo's work was selected for a short oral presentation during the L-H transition/pedestal physics session. (R. Maingi)

Steve Sabbagh (Columbia University) helped formulate and run DIII-D experiment MP 2011-14-01 "Validation of kinetic resistive wall mode stability models using off-axis NBI" (J. Hanson, et al.) during the period 9/16/11 – 9/20/11. The experiment is a joint effort to compare NSTX and DIII-D results examining the physics of RWM stabilization that directly support ITPA joint experiment MDC-2 on the determination of RWM stabilization physics. The run extended results from a past DIII-D experiment and showed clear differences in resonant field amplification when various levels of off-axis NBI power were used, indicating a variation of RWM stability (normalized beta and plasma internal inductance constant). (S. Sabbagh)

Steve Sabbagh (Columbia University) attended and presented two talks at the ITPA Macroscopic Stability meeting held at Consorzio, RFX (Padua) 10/4/11 – 10/8/11: "Reduced Disruption Probability in NSTX High Performance Plasmas" and "ITPA MDC-2 Joint Research: benchmarking RWM stability physics between codes, and experiments". Joint experimental results from NSTX (XP-1020) and DIII-D (MP 2011-14-01) were shown, along with significant RWM stability code (MISK (J. Berkery, et al.), MARS-K (Y. Liu, et al.), HAGIS (I. Chapman, et al.), VALEN (J. Bialek, et al.), CarMa (F. Villone, et al.)) benchmarking comparisons organized through MDC-2 and MHD Working Group 7. (S. Sabbagh)

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

NSTX Upgrade construction activities began this week with the implementation of the Work Control Center to schedule and coordinate all test cell activities throughout the construction phase of this project. Daily 8AM construction activity planning meetings and pre-job briefs for specific tasks are now underway. Machine technicians continued with RF wave-guide removals in the test cell. Piping is being crated up and being moved to storage areas in the D-Site Test Cell basement.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Lithium Evaporators (LITERs)
  - Lithium loaded LITER units F1 and K2 were operated on their Fill Stands to evaporate their lithium loads, and are now empty. LITER units F2 and K1 have been vented with argon and moved to storage

- Lithium Centrifugal Granule Injector for ELM Pacing
  - The assembly of the vacuum cube chamber was completed.
  - The impeller rotation was tested with the cube under vacuum, and it achieved 15,000 rpm within 3 to 5 seconds.
  - The assembly of a 1 m drift tube for unit testing was completed.
  - The final pieces for the completion of the operational assembly are being machined and brazed.

- Lithium Pellet Injector (LPI)
  - Work started to prepare the LPI and associated parts for storage.