NSTX Weekly Report (May 28, 2010)

FY 2010 NSTX plasma operations
Planned: Total - 15 run weeks (Base - 14 run weeks, ARRA - 1 run week)
Completed: Base - 0.99 run week and 157 plasma shots
Completed: ARRA -1.01run week and 171 plasma shots

Members of the NSTX Research Team participated in the 19th International Conference on Plasma Surface Interactions that was held in San Diego, CA on 24-28 May 2010. https://fusion.gat.com/conferences/psi2010/. The NSTX talks included two orals: "NSTX Plasma Response to Lithium Coated Divertor" by H. W. Kugel and "Characteristics of heat and particle flux deposition in 3-D field applied H-mode plasmas in NSTX" by J.-W. Ahn (ORNL). Both talks were well received. Fourteen poster presentations were given. Twelve papers have been submitted for publication in Journal of Nuclear Materials. The poster given by Filippo Scotti (Princeton U) was recognized as the best graduate student poster in PSI-19 Poster Session 3. The poster presentations included: "Measurements and 2-D Modeling of Particle Balance Recycling, and Core Fueling in Discharges with Lithium-coated PFCs in NSTX" by J. Canik (ORNL), "Surface chemistry and physics of D-retention in lithiated graphite" by C. Taylor (Purdue U), "Turbulent Transport and the Scrape-off-Layer Width" by J. R. Myra (Lodestar Research Corp.), "Snowflake² divertor configuration in NSTX" by V. A. Soukhanovskii (LLNL), "Poloidal Distribution of Intermittent Events (Blobs) in the Scrape-off Layer and Divertor of the National Spherical Torus Experiment" by R. Maqueda, "Dependence of the divertor heat flux profiles on the plasma boundary shape in the National Spherical Torus Experiment" by T. K. Gray / R. Maingi (ORNL), "Downstream Heat Flux Profile vs. Midplane T Profile in Tokamaks" by R. J. Goldston, "Simulations of Diffusive Lithium Evaporation onto the NSTX Vessel Walls" by D. Stotler, "Macroscopic Motion of Liquid Metal Plasma Facing Components in a Diverted Plasma" by M. Jaworski, "Improved H-mode Performance by Injection of Lithium Aerosol into the NSTX Scrape-Off Layer in Real Time" by D. K. Mansfield, "3-D reconstruction of pre-characterized lithium dust particle trajectories in NSTX" by J. Nichols, "Deuterium Retention in NSTX with Lithium Conditioning" by C. H. Skinner, "Observation and modeling of inner divertor re-attachment in discharges with lithium coatings in NSTX" by F. Scotti, and "Reduction of Low-Z Impurities During Plasma Start-up Through The Application Of Large Surface Area Biased Electrode Discharges" by R. Raman (U. Washingtion). [V. A. Soukhanovskii (LLNL)]

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

NSTX plasma operations resumed this past week after completion of combined field power testing, leading to the successful performance of the experimental machine proposal (XMP) to re-establish control of NBI heated plasmas. Both Liter probes were used for lithium evaporation which was effective in helping to achieve 1 second discharges. All three neutral beam ion sources were reconditioned to 90keV, and are now routinely support plasma operations. Also this week, the new ARRA-funded Switching Power Amplifier (SPA) power supply to be used for individually powering the Resistive Wall Mode error field coils underwent testing at the manufacturer's facility, and was witnessed by PPPL engineering.

Access to the NSTX test cell will be restricted next week during plasma operations. Access will be available each evening after 5PM.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

• Lithium Evaporators (LITERs)
- LITER units K2 was inserted in the vessel and degassed. LITER units F2 and K2 were used to support the completion of XMP-064 for the restart of normal operations.