NSTX Weekly Report (April 15, 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

A manuscript "Electromagnetic transport from microtearing mode turbulence", W. Guttenfelder (PPPL) et al., was published in Physical Review Letters **106**, 155004 (2011). This paper presents first non-linear gyrokinetic simulations of microtearing mode turbulence in NSTX. The simulations predict electron thermal transport that is comparable to experimental analysis, illustrating that microtearing turbulence can indeed be important in STs. The transport is dominated entirely by magnetic "flutter" and perturbed field lines are globally stochastic. While the predicted transport increases dramatically with electron temperature gradient, it can also be suppressed by experimental levels of ExB shear. (W. Guttenfelder)

NSTX Project received the State of New Jersey Commissioner of Labor and Workforce Development's 2010 Continued Excellence Award for working ten (10) consecutive years (2,011,666 hours) without an away from work lost time injury/illness case. (J. Levine, PPPL)

C. H. Skinner (PPPL) participated in the ITER Conceptual Design Review for the Gas Injection System and Glow Discharge Discharge Cleaning System at Cadarache, France, April 11-13, 2011. (H. Kugel, PPPL)

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

The NSTX outage continued this past week with the final alignments / torquing of the lower inboard divertor tiles, and the start of in-vessel diagnostic calibrations utilizing the Romer measuring arm. New shutter assemblies for the BES and MPTS diagnostics have been installed and tested. The diagnostic neutral beam for the new MSE-LIF is in place in the test cell and will be pumped down and tested before installing the flight tube to connect to the NSTX vacuum vessel. Also this week, pre-operational testing of the new Switching power Amplifier (SPA) system began.

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 Preliminary Design Review (PDR) and the Final Design Review (FDR) for the ORNL Fast Thermocouple (FTC) systems were held and found to be successful (A. McLean).
  - The components for 2 ORNL Fast Thermocouple systems were received from the vendor. The wire welding and vacuum baking of the FTC in-vessel components were completed.

- The Outer Divertor, Bay H, LLD gap tile was removed from the vessel, and the machining modification has started for installation of the ORNL Fast Thermocouples

- Molybdenum Tiles
  - A heat gun test was performed on the installed Row-1 Molybdenum Thermocouple sensor tile, and the Row-2 Graphite Thermocouple sensor tile. Both thermocouples were found to respond, and their respective responses were displayed on the EPICS TC02 page (P.Sichta).

- Material Analysis Particle probe (MAPP)
  - The design of the probe support reached 50% completion. The design of the internal connector tube and associated bushings, and the external mounting plate reached 90% completion. (R. Ellis III)

Diagnostic Operations (R. Kaita)

Calibrations preceding the upcoming NSTX run are continuing. Precision metrology has been performed for systems that include Motional Stark Effect/Laser-Induced Fluorescence (MSE-LIF) diagnostics, high-k scattering, and various visible spectroscopic and imaging instruments.