

NSTX Weekly Report (Mar. 2, 2007)

FY 2007 NSTX plasma operations started on Feb. 19, 2007.

Planned: 10 weeks

Completed: 1.58 weeks (through Feb. 28, 2007)

- A mini-workshop on diagnostics for the next NSTX five-year plan (covering FY09-13) was held at PPPL on February 27. A total of 19 talks were given, including 5 summaries of diagnostic needs that arose from the other physics-topic mini-workshops and 14 talks on specific diagnostic proposals. The presentations and the discussion provided much useful information to guide the preparation of the five-year plan.

- Six mini-workshops in support of the next NSTX five-year plan science topical areas are now complete. We thank your contributions to this important planning process. For more information such as the presentation material, please visit our NSTX website:

[http://nstx.pppl.gov/DragNDrop/Five%20Year%20Plan%20\(FY09-13\)/](http://nstx.pppl.gov/DragNDrop/Five%20Year%20Plan%20(FY09-13)/)

We would like to note that this is only the first step for the long range planning process which will continue to the spring of 2008. If you have any good ideas and suggestions, please let the respective science topical leaders know or contact mono@pppl.gov directly. A remaining mini-workshop will be on "Fusion Energy Sciences Development using ST" during March-April with details to be announced, MPeng@pppl.gov.

- There will be an NSTX Physics Meeting on Monday, 3/5 at 1:30 PM in LSB318. We will have short presentations from those who ran XPs during the week of 2/26 (and who are here on Monday!): R. Maingi: XP709 - SOL width scaling, R. Maingi: XP721 - Small ELM regimes, S. Medley: XP707 - NPA scan, V. Soukhanovskii – XP708: Radiative divertor, VIPS measurements of Nitrogen (S. Kaye)

Run Coordination (D. Gates, M. Bell)

On Thursday Feb 22nd XP 709 entitled "Scrape-off layer width scaling" was run. Data was obtained simultaneously with the UCSD reciprocating probe and the IR cameras looking at the lower divertor. A constant-q scan was performed. Vacuum conditioning of the RF antenna was completed in the evening. On Friday February 23rd XMP-26, "Bring HHFW online" was run. The antennas were operated at up to ~2MW into helium plasmas at 5.5kGauss.

On Monday February 26th XP-721 entitled "Comparison of Small ELM regimes" was run. Amanda Hubbard from Alcator C-Mod, Hendrick Meyer from MAST, and Rajesh Maingi from NSTX (ORNL) lead the experiment, which is ITPA sponsored. The desired elongation ~ 1.7, low triangularity shape was obtained, but H-mode access was elusive.

On Tuesday February 27th XP-707 entitled "Direct Measurement of MHD-induced Energetic Ion Redistribution in Space and Energy by NPA Vertical Scanning" was performed. The entire scan was completed. A neon glow for CHERS calibration was performed in the evening.

On Wednesday February 28th XP-703, "B and q-scaling of the low density locked mode threshold at low-A" was completed in the morning. XP-711 "Improved breakdown scenario for higher q during current ramp" was run in the afternoon. H-mode was achieved as early as 60ms after breakdown, which is the earliest H-mode ever achieved on NSTX.

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

NSTX plasma operations continued at 5.5 kG last week in support of XP-709 "Scrape Off Layer (SOL) width scaling", which made good use of the UCSD Fast Probe, and for conditioning of the HHFW antennas into plasma. After a vacuum vessel boronization over the weekend, progress was made on XP-721 "Small ELM regime comparison", comparing small elm development on MAST, C-MOD, and NSTX, and XP-707 "NPA scan in double-null H-mode plasmas" was completed. Integrated system testing of the PF4 coil/power system was completed in preparation for an upcoming MSE calibration, and additional shots were taken in support of XP-703 "B and q scaling of low-density locked mode threshold at low-A" and XP-711 "Breakdown optimization". Also this week, a neon glow was performed to calibrate the CHERS and PCHERS diagnostics, and work continued on the commissioning of the new LITER 1d lithium evaporator.

NSTX will begin a scheduled maintenance week upon conclusion of operations on the evening of Friday, Mar 2nd, and the test cell will remain open around the clock until the start of machine area scrubs on the following Friday.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- The LITER1d candidate ceramic thermal insulation was installed on unit-1. Subsequent testing derived a more favorable design, and reconfiguration is in progress. Assembly of unit-2 was started. In the Lithium Test Facility, parts for improving the pumping system were obtained and installation was started.
- Work continued toward completing the LPI maintenance and preparing for its reinstallation on NSTX after the completion of NPA vertical scan experiments. (G. Gettelfinger)
- NSTX TMB Boronization-60 (~5g) was performed. (W. Blanchard)

Diagnostic Upgrades (B. Stratton)

- One of the two CCD cameras for the new Poloidal-CHERS diagnostic was repaired by the manufacturer last week. It was re-installed and aligned on the background-view spectrometer last weekend. The interim P-CHERS diagnostic (both spectrometer/detector systems) has been taking data since February 26. A neon glow calibration was performed on February 27 to determine the wavelength calibrations and instrumental functions for the P-CHERS, Toroidal-CHERS, and Edge Rotation diagnostics. (R. Bell)

Diagnostic Operations (R. Kaita)

- Connections to the phosphor for the SPRED vacuum ultraviolet survey spectrometer have been repaired, and tests will be performed during the upcoming maintenance week to determine if this corrects the loss of signal. The performance of the LLNL XEUS X-ray spectrometer will also be investigated next week. Data have been obtained during plasma operations thus far, but signal levels have been lower than expected. A technician from LLNL will be at PPPL to address this issue.