

NSTX Weekly Report (Feb. 16, 2007)

FY 2007 NSTX plasma operations

Planned: TBD

Completed: 0 weeks

- A 5-year plan brainstorming meeting for boundary physics opportunities in NSTX for the period 2009-2013 was held on 2/12/07. Eighteen speakers from ten different institutions presented a range of intermediate and long term ideas, including new research initiatives, innovative diagnostics and control tools. This meeting was an important step in obtaining community-wide input toward identification of the important elements of the boundary physics portion of the next 5-year program cycle, representing 2009-2013. (R. Maingi, ORNL)

- A 5-year planning meeting to identify wave and energetic particle research opportunities in NSTX for the period 2009-2013 was held on 2/13/07. Eleven speakers from six institutions presented intermediate and long term research ideas, including possible upgrades to heating and diagnostic systems and improved RF and energetic particle modeling tools. The meeting was the first step in obtaining broad research community input to the waves and energetic particles component of the 2009-2013 NSTX research program. (G. Taylor)

- A 5-year plan brainstorming meeting for integrated scenario development (ISD) opportunities on NSTX for the period 2009-2013 was held on 2/16/07. Five speakers presented a range of ideas including an NHTX overview and how to incorporate NHTX/CTF goals in NSTX research, integrated scenario modeling, coaxial helicity injection and PF-only startup upgrades and plans, and the development of high-confinement double-transport-barrier discharges. These presentations motivated extensive discussion which greatly aided in prioritizing possible analysis activities and hardware upgrades to enhance integrated high performance scenarios in NSTX for the next 5-year program period. (J. Menard)

- R. Kaita has been invited to give a lecture on plasma physics and controlled thermonuclear fusion at Messiah College in Grantham, Pennsylvania on February 16, 2007. His talk includes highlights from research on NSTX and CDX-U.

- The updated schedule for the remaining mini-workshops is as follows:
 - Transport and Turbulences, Feb. 19, 1:00 – 5:00 in LSB 318, SKaye@pppl.gov.
 - MHD: Feb. 23, 1:00 – 5:00 in Dir. Conf. Room, SSabbagh@pppl.gov.
 - Advanced Diagnostics: Feb. 27, 1:00 – 4:00 in LSB 318, BStratton@pppl.gov.

Please send your ideas for a presentation or any questions to the respective meeting organizers. The remote connection will be available for the meetings. For more information, 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)/)

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

NSTX start-up activities were completed this past week with a scrub of the machine areas and a set of combined field test shots over the full range of our operating parameters. The neutral beam ion sources

have been conditioned to a level ($\sim 90\text{kV}$) to complete in-vessel aiming, and to support a calibration of the Motional Stark Effect (MSE) diagnostic. The beams were also fired into a plasma to evaluate machine conditions, and vacuum conditioning of the HHWW antennas was started. A vacuum vessel boronization was performed over the weekend in preparation for the start of experiments with the first XP of the year (Breakdown Optimization) on Monday.

The NSTX test cell will be in restricted access during the 1st shift this coming week. Test cell access will be available from 5PM to 10PM during the week, except on Thursday evening where we plan on keeping the test cell locked up to continue vacuum conditioning of the RF antennas.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- The machining of the remaining parts for three LITER-1d canisters was completed. Final welding of the 3 canisters is 95% complete, and preparations are in progress to begin the vacuum annealing bake of the 3 canisters for following the welding process. A trial fit-up of the heaters on one of the nearly completed units was successful. The upgrade of the L-245 Lithium Test Facility was completed, and assembly of the vacuum chamber and pumping system was started.
- A longer and heavier thin sabot for powder injection was tested in the LPI, and the results compared well with the expected theoretical value (D. K. Mansfield). LPI maintenance was initiated in preparation for forthcoming impurity injection experiments (G. T. Czeizinger, G. Gettelfinger).
- Measurements of the gas volume of the SGI components during the SGI upgrade were completed showing a net plenum volume gain of 45.6 ml. The total volume is larger than this volume change, since it includes all SGI gas hardware including the sample cylinder, tubing etc. (T. Provost, V. Soukhanovskii, LLNL)

Diagnostic Operations (R. Kaita)

- The new transmission grating (TG) soft X-ray spectrometer from Johns Hopkins University was installed on NSTX. It is being baked out, and will be opened to the vacuum vessel by the end of the week.