

NSTX Weekly Report (Jan. 26, 2007)

FY 2007 NSTX plasma operations

Planned: TBD

Completed: 0 weeks

- Joseph Johnson and Ephrem Mezonlin of Florida A and M University visited PPPL on Monday, January 22, to discuss collaboration possibilities on NSTX. Ephrem Mezonlin also gave a seminar talk entitled, "Ion Temperature Measurements using a Compact Neutral Particle Analyzer on Sustained Spheromak Physics Experiment (SSPX)." (R. Kaita)
- There will be an NSTX Physics Meeting on Monday, Jan. 29 at 1:30 pm in LSB 318. Dennis Mueller will give a summary of his trip to EAST and Martin Peng (ORNL) will give a summary of C-Mod PAC meeting. (S. Kaye)
- **Waves and Energetic Particles Mini-Workshop:** NSTX is starting to prepare a research plan for the period FY09-13. To initiate the development of the plan we will be holding a series of "mini-workshops" in February. I am organizing the Waves and Particles meeting, which will be held on Tuesday, February 13 from 9 am to noon in LSB 318. At the meeting I invite you to present research ideas for the five year time frame from FY09 until FY13. Please start thinking of ideas that you would like to present at this meeting. These ideas can be new or extensions of work already in the FY04-FY08 plan. Everyone who would like to make a short presentation will have an opportunity to do so. However, presentations will be limited to 10 minutes. There will be facilities for remote participation. I have placed two files in the folder on the NSTX Web site that may help you plan your presentation at the meeting. These files can be found at this Web address:
[http://nstx.pppl.gov/DragNDrop/Five%20Year%20Plan%20\(FY09-13\)/Waves%20and%20Energetic%20Particles/](http://nstx.pppl.gov/DragNDrop/Five%20Year%20Plan%20(FY09-13)/Waves%20and%20Energetic%20Particles/) One file contains a summary of progress made in our present FY04-08 plan which was presented at the NSTX Mid-Point Review last September and the other contains a short presentation at the Five Year Plan kickoff meeting last December that lists some possible topics that could be addressed in the FY09-13 period. Please look at these results and ideas and start formulating your own. I will send an email next week asking for your input and suggestions for possible presentations. (Gary Taylor)
- **Boundary Physics Mini-Workshop:** NSTX is starting to prepare its next Five Year Plan, covering the time period from FY09-FY13. As part of this exercise, topical group meetings will be held to discuss physics issues and experiments, theory/code development and application, and facility and diagnostic additions /upgrades for this period. I am organizing the topical meeting in the area of boundary physics, which will be held on **Monday, Feb. 12.**
This is envisioned as a true brainstorming meeting, with individual presentations and discussion. The meeting is anticipated to last for 4-8 hours, depending on the number of presentations. We hope to have contributions from the other large domestic facilities, C-MOD and DIII-D, as well as from the ST community (e.g. MAST) and maybe even European tokamaks. With your participation, a compelling boundary physics program can be devised, one that fits in well with the domestic and international programs. Instructions for remote participation via H323, or a separate phone connection, will follow in a separate email.

The boundary physics presentation from the latest NSTX PAC-21 meeting (which discussed the main elements of the FY 07-09 plan) in Jan. 2007 is available at

http://nstx.pppl.gov/DragNDrop/PACs/PAC-21/Soukhanovskii_PAC21_Boundary_v3b.pdf

and a short kick-off meeting presentation from Dec. 2006 is attached.

Please let me know if you would like to make a 10-15 minute presentation, as well as a provisional title. (R. Maingi, ORNL)

• **T&T Mini-Workshop:** As a follow-up to the previous announcement, I would like to solicit input for presentations at the brainstorming session for the Transport and Turbulence Five Year Plan. The presentations should be focused on physics issues, experiments, theory/code development and diagnostic and facility upgrades and additions for the period FY09-14. The meeting will be held on Thurs, Feb. 15 starting at 1 PM. There will be remote access.

Please send me your ideas for a presentation. I have attached the documents describing the T&T results and progress in the present Five Year period, as well as some potential areas in which to concentrate in the future. (S. Kaye)

NSTX Next 5 Year Plan Mini-workshop schedule:

- **Boundary Physics:** Feb. 12, 9:00 – 5:00, LSB 318, PPPL, RMaingi@pppl.gov.
- **Waves and Energetic Particles:** Feb. 13, 9:00 – noon, LSB 318, PPPL, GTaylor@pppl.gov.
- **MHD:** Feb. 14 (Time to be announced), LSB 318, PPPL, SSabbagh@pppl.gov.
- **Transport and Turbulences,** Feb. 15, 1:00 – 4:00, LSB 318, PPPL, SKaye@pppl.gov.
- **Integrated Scenarios:** Feb. 16, 1:00 – 5:00, LSB318, PPPL, JMenard@pppl.gov.
- **Advanced Diagnostics:** Feb. 27, 1:00 – 4:00, LSB 318, PPPL, BStratton@pppl.gov.

In addition, there will be a mini-workshop on “**Fusion Energy Sciences Development using ST**” during March-April with details to be announced, MPeng@pppl.gov.

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

NSTX start-up activities continued this week with the completion of Rayleigh and Raman scattering calibrations of the Multi-pulse Thomson Scattering (MPTS) diagnostic, and the start of the vacuum vessel bake. Round the clock neutral beam helium refrigerator operations began this week and the liquid nitrogen cool-down of the beam-line is in progress. Also this week, preparations for the fabrication of a new lithium evaporator (LITER-1d) continued.

The NSTX test cell will remain in restricted access during bake-out operations this coming week. Bake-out system operators can escort staff to safe areas of the test cell as needed.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- A column of boron powder loaded into a sabot, 12.7 cm long, was accelerated in the prototype pellet injector to about 5 m/s, and launched onto a piezoelectric target detector at a distance of 36 cm with excellent efficiency. Experiments are in progress to determine the temporal spread of the incident powder on the detector. (D. K. Mansfield)
- Thermal and vacuum compatibility testing of materials for LITER-1d was initiated. The resistance wire of the candidate heaters exhibited only minor brittleness after raising its temperature to 1000°C.

All fabrication drawings have been drafted. Requisitions were placed for materials and supplies. Fabrication of the metal canister parts was initiated.

- For the Supersonic Gas Injector upgrade, the rerouting of the Bay L gas line and installation of the air operated valve and the new high-pressure regulator are complete. During the bake-out, the valve and assembled sensor array will be installed and connected along with the wiring and plumbing. The design of the platform for access to the Bay K top injector is awaiting review. Other components will be installed after post bake-out. All hardware is checked and ready. (W. Blanchard, V. Soukhanovskii, LLNL)

Diagnostic Operations (R. Kaita)

- Rayleigh and Raman scattering calibrations for the Multipoint Thomson Scattering (MPTS) electron temperature diagnostic were completed.