

NSTX Weekly Report (April 1, 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

The 2nd International Symposium on Lithium Applications for Fusion Devices will be held on April 27 – 29, 2011 at Lyman Spitzer Building, M. B. Gottlieb Auditorium, Princeton Plasma Physics Laboratory, Princeton, New Jersey, USA. The symposium program includes sessions for Lithium in Magnetic Confinement Experiments, Special Liquid Lithium Technology Session, Lithium Laboratory Test Stands, Lithium Theory / Modeling / Comments, Innovative Lithium Applications, and Panel Discussion on Lithium PFC Viability in Magnetic Fusion Reactors. The symposium information is available on the symposium web page <http://isla2011.pppl.gov/>. For those interested in presenting post-deadline posters at the symposium, please submit one page abstract with completed registration form which can be down loaded from the symposium web site to mono@pppl.gov.

Joon-Wook Ahn, (ORNL) Ahmed Diallo (PPPL), and Rajesh Maingi (ORNL) presented talks at the ITPA pedestal group meeting at MIT, held March 30-April 1: Dynamical evolution of the pedestal parameters in ELMy H-mode on NSTX (Diallo); Progress on characterization of the enhanced pedestal H-mode in NSTX (Maingi); and Effect of 3D fields on divertor detachment and associated pedestal profiles in NSTX H-modes (Ahn). Diallo and Maingi also represented NSTX at a work planning meeting for the FY11 Joint Research Target on Pedestal Structure, also held at MIT; CS Chang participated remotely. (R. Maingi)

R. Kaita (PPPL) gave a colloquium presentation entitled “Introduction to Plasma Physics and Fusion Energy Research on the National Spherical Torus Experiment” to the Department of Physics at Gordon College in Wenham, MA on March 24, 2011. In the audience were physicists with expertise in materials science, and they will be provided with more details about PPPL activities in this area. (R. Kaita)

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

The NSTX outage continued this past week with the completion of in-vessel welding of the window, tube and shutter feed-thrus for the new tFIDA diagnostic, as well as the studs for the new Mirnov coils. The construction floor was then removed from the NSTX vessel, and Liquid Lithium Divertor (LLD) plates, now refitted with new thermocouples and mounting hardware, are being reinstalled. New Molybdenum tiles to replace graphite in the lower divertor are in the Vacuum Prep Lab, and new stainless steel mounting bases for these tiles have arrived. Also this week, a second in-vessel flux loop was replaced, the refurbished MPTS shutters were reinstalled, and the reassembly of the new Diagnostic Neutral Beam continued in the test cell.

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 installation of the 4 plates and surrounding graphite tiles was completed.
 - Digital depth gauge measurements of all surrounding graphite tile heights relative to the LLD plates were completed.
 - Romer Arm measurements of the lower divertor area were completed.
 - Installation of the plate thermocouple cabling under the graphite tiles to the outer wall was completed.
 - Preparations are in progress for connecting the plate thermocouples to the external cabling.

- Lithium Evaporators (LITERs)
 - The welding of parts for 4 new units is in progress and some were completed.
 - Dissection of the LITER-2010-F1 unit was completed. This unit had exhibited damage to the snout heater and thermocouple wires. Dissection revealed that lithium had entered under the radiation shielding, eaten through the interior ceramic shielding, and attacked the heater and thermocouple wiring. This may be attributable to snout shield damage during probe insertion that may have provided entry points for lithium vapor both directly and reflected from the nearby LITER shutter.

- Material Analysis Particle probe (MAPP)
 - Special ATJ graphite sample coupons were received from the Purdue collaborators (J.P.Allain, et al.) for installation on the outer midplane of the vessel before pump-down.

- Lithium Particle Centrifuge Injector
 - The sorted lithium granules received from the vendor were seen to be very spherical and showed no tendency to stick together. They were successfully tested in the dropper and flowed as easily as lithium powder.
 - The prototype impeller/motor housing was machined and successfully operated in the Injector Test Stand. Impeller speeds of about 100 m/s (15,000 RPM) were achieved using an electric motor, and about 85 m/s (12,500 RPM) using an air motor. The prototype laser tachometer operated successfully.
 - The demonstration of these two items satisfies concerns in Chits submitted at the CDR.