

NSTX Weekly Report (April 29, 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 was 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 included 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. Over 50 presentations were presented by researchers from 26 institutions in 10 countries. Lithium experimental results from 9 magnetic confinement devices and 17 dedicated lithium test stands were reported. There were also valuable participations from theory, IFMIF, and TBM communities. The symposium information including the presentation material is available on the symposium web page <http://isla2011.pppl.gov/>. (M. Ono, PPPL)

A manuscript, "Effect of non-axisymmetric magnetic perturbations on divertor heat and particle flux profiles in National Spherical Torus Experiment", J-W. Ahn (ORNL), et al, has been published in Physics of Plasmas 18, 056108 (2011). This paper extends the result previously reported in the 2010 Nuclear Fusion paper. It presents effect of 3-D fields, both externally applied and internally arisen, on the divertor profiles and identifies the breaking pattern ($n=1$ and $n=3$) of the axisymmetric divertor heat and particle deposition. The effect of q_{95} and pedestal electron collisionality was also investigated. It is found that the heat flux from the triggered ELMs follows the mode number of the applied perturbation. The external magnetic perturbation can reattach detached divertor plasma, but this can be overcome by detaching the plasma with additional divertor gas puffing. (J-W. Ahn)

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

The NSTX outage continued this week with the completion of all in-vessel diagnostic spacial calibrations and associated welding tasks. The MPTS optics box was reinstalled after completing tFIDA diagnostic installations, and Laser operation to align the MPTS is scheduled to start Monday morning. The last of the external RWM coils was reinstalled and HiPotted this week.

Access to the NSTX test cell will be restricted this coming week during MPTS Laser operation.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Liquid Lithium Divertor (LLD)
 - The connection of the internal cabling for the Fast Thermocouples was completed.

- Materials Analysis Particle Probe (MAPP)
 - The design of the rotary stage drive was completed.
 - The design of the internal connector tube and bushings was completed.

Diagnostic Operations (R. Kaita)

The calibrations prior to NSTX operations are nearly complete. They included position measurements for the visible bremsstrahlung detector and the tangential bolometer array. The “white plate” calibrations were also finished for the tangential and poloidal charge-exchange recombination spectroscopy (CHERS and pCHERS) arrays, the edge rotation diagnostic (ERD), and the new real-time velocity (RTV) measurement system.