

NSTX Weekly Report (February 18, 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

A paper, "Comparison of Scrape-Off Layer Turbulence Simulations with Experiments Using a Synthetic Gas Puff Imaging Diagnostic" by D. A. Russell et al., was published in Phys. Plasmas **18**, 022306 (2011). In this work, a synthetic gas puff imaging (GPI) diagnostic, added to the scrape-off layer turbulence (SOLT) simulation code, enables comparisons with GPI data from NSTX. The edge and scrape-off layer are modeled in the radial and poloidal (bi-directional) dimensions of the outboard midplane region of the plasma. A low-confinement mode discharge is simulated by choosing reference parameters, including radial density and temperature profiles, to be consistent with those of the shot (#112825). NSTX and simulation GPI data are submitted to identical analyses. It is demonstrated that the level of turbulent fluctuations in the simulation may be adjusted to give synthetic GPI radial intensity profiles similar to those of the experiment: for a "best case" simulation, SOLT and NSTX probability distribution functions of blob radial locations, widths and GPI image velocities are compared. For the simulation, synthetic GPI image velocity and fluid convection (\mathbf{ExB}) velocity are compared and contrasted. (D. A. Russell, Lodestar Research)

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

The NSTX outage continued this past week with the VPL preparation of the window and tube for the new tFIDA diagnostic which is scheduled for installation next week. The bay G port cover that was modified to accept the MSE-LIF DNB diagnostic was reinstalled. The MSE DNB hardware has been brought to D site to be lifted into the NTC. Machining of the Liquid Lithium Divertor (LLD) plates needed for new mounting hardware has started. Test cleaning also proved successful. Also this week, modifications of tile mounting rails at bay K bottom needed for the installation of MAPP were completed, and molybdenum covers were installed on the remainder of the Bz coils. Diagnostics calibrations continued in vessel. Five magnetics sensors were repaired in vessel and several passive-plate flux loops are being evaluated while the passive plates are removed. The two freshly rebuilt NBI helium compressors were lifted into place on the compressor skid and will now be aligned in preparation for the coming run period.

The NSTX Test Cell will be closed this weekend for a neutron calibration. 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 modification of the first LLD plate has started.
 - A Peer Review of reinstallation of LLD plate Rogowski coils was a success. Several recommendations were adopted, and the work is proceeding.

- Lithium Evaporators (LITERs)
 - Materials were purchased for the fabrication of LITERs 2011.
 - Investigation of a concept for monitoring the alignment using a reentrant window and existing Boroscopes was started.
- Lithium Granule Centrifuge for ELM Pacing
 - Materials were purchased for the testing required for scheduling the Final Design Review.
- Disruption Mitigation
 - The vessel umbrella structure was lowered, and preparations started for modifying the LDGIS system for disruption mitigation studies in support of ITER.