

NSTX Weekly Report (December 10, 2010)

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

On Friday December 10, an NSTX team discussion was led by Jon Menard (the NSTX program director) to discuss the proposed research milestones for the FY11-12 run campaigns (J. Menard).

A paper entitled "Effects of toroidal rotation shear on toroidicity-induced Alfvén eigenmodes in the National Spherical Torus Experiment" by M. Podestà (PPPL) et al. was published online in Physics of Plasmas this week. The paper investigates the effects of the shear in the toroidal rotation on the dynamics of bursting Toroidicity-induced Alfvén Eigenmodes (TAEs). No clear correlation is observed between an increase in the rotation shear and the modes' behavior. This suggests that other mechanisms dominate the mode evolution, for instance the fast ion drive. Analysis of discharges with NB only and NB+RF injection in the presence of weakly unstable TAEs supports this conclusion. (M. Podestà, PPPL)

On 12/8/10, D. K. Mansfield gave a talk at the GA Research Opportunities Forum outlining the physics of ELM triggering/pacing with spherical lithium granules rather than deuterium pellets. Several discussions were then held with DIII-D program managers about the mutual advantages and possibilities of collaboration in this area. (D. K. Mansfield)

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

The NSTX outage continued this past week with the completion of in-vessel diagnostic calibrations and the start of the tile sanding/cleaning. A Liquid Lithium Divertor (LLD) plate cleaning procedure has been reviewed and approved, and will be performed after the completion of a set of LLD plate measurements and tests. The neutral beam calorimeter was removed from the beam-line and moved to the South High Bay to implement bellows assembly upgrades. Also this week, helium and water piping modifications needed for the new MSE-LIF diagnostic continued, as well as power cable installations for the addition of the second Switching Power Amplifier system.

Access to the NSTX test cell will be available this coming week, but in-vessel access will be limited during tile sanding and cleaning.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Liquid Lithium Divertor (LLD)
 - Design and planning work started for fabricating and testing an upgraded ceramic break and strain relief unit for the LLD gas heating system.
 - A procedure was completed and approved for the post-run cleaning of the LLD plates.

- Lithium Evaporators (LITER)
 - A meeting was held to assess the required LITER maintenance and upgrade options.
- Molybdenum Inner Divertor Tiles
 - A meeting was held to review the molybdenum tile design and remaining tasks. Molybdenum plate material was ordered and is scheduled to arrive the first week in January
 - J. Brooks was provided information to facilitate the simulation of NSTX molybdenum divertor tile behavior.
- Disruption Mitigation
 - A meeting was held to discuss installing lower divertor region equipment to investigate the use of prompt massive gas injection to mitigate plasma current disruptions.

Diagnostic Operations (R. Kaita)

- The in-vessel calibrations for diagnostics are essentially complete. Measurements were performed for the divertor fast visible cameras, edge neutral density diagnostic (ENDD), 1-D CCD cameras, and filtered edge visible detectors.