

NSTX Weekly Report (Jan. 12, 2007)

FY 2007 NSTX plasma operations

Planned: TBD

Completed: 0 weeks

- 144 shots from the 2005 NSTX experimental campaign were submitted to the international H-mode database. L-mode data from the same campaign will be submitted soon. (S. Kaye)
- A paper titled "Relativistic description of electron Bernstein waves," by J. Decker and A. K. Ram has appeared in the November 2006 issue of Physics of Plasmas. This paper develops an analytical model for including relativistic effects in the propagation and damping of EBWs in NSTX-type plasmas. The physics of the simplifying assumptions is detailed and a comparison with exact results is made in order to justify these assumptions. The model facilitates detailed calculations without resorting to time-consuming numerical simulations with a fully relativistic dielectric tensor for EBWs. Relativistic effects are needed in EBW current drive studies even for temperatures in present NSTX plasmas. (A.K. Ram, MIT)
- Tom Osborne (General Atomics) visited PPPL for 1 week to continue adaptation of his profile analysis tools for NSTX. The capability to use data from the recently available 30 point Thomson system has been imported into the analysis packages. Profile analysis of the DIII-D/MAST/NSTX pedestal / aspect ratio scaling ITPA experiment has begun. (R. Maingi, ORNL)

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

NSTX start-up activities continued this week with the power testing of individual field coils after the completion of fault and safety system interlock testing, end-to-end continuity measurements and electrical insulation tests (HiPots). Also this week, ceramic breaks in the new bakeout piping to the lower divertor were installed, and pre-operational testing of the MPTS diagnostic was started.

Access to the NSTX test cell will be available on Monday and Tuesday of the coming week, but will be restricted during MPTS testing for the remainder of the week.

Physics Analysis (S. Kaye)

David Mikkelsen worked with Ron Waltz and Jeff Candy at GA on simulations of ETG turbulence in NSTX plasmas. Many convergence tests have now been carried out, and they exhibit very stable results. We expect that the large ExB shear in NSTX will simplify the calculations and enable affordable simulations of ETG turbulence. (D. Mikkelsen)

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Charles Skinner attended the joint meeting between the School of Engineering and Applied Science

and PPPL in the Engineering Quad on 20 December. Several areas of potential collaboration between PPPL and main campus were discussed.

- The NSTX in-vessel quartz crystal microbalances have been restored to operation with new crystals for the upcoming run and characterizing conditions prior to bakeout is in progress.

Diagnostic Operations (R. Kaita)

- An absolute intensity calibration of the visible bremsstrahlung detector was performed.
- The power supply for the microwave source for the high-k scattering turbulence diagnostic was repaired by UC Davis.
- The optics for the new SWIFT two-dimensional flow diagnostic were set up. Test images were successfully obtained with the Hiroshima University fast visible camera.