

NSTX Weekly Report (Oct. 7, 2005)

FY2005 Joule milestone: 17 weeks

Completed: 17.97 weeks producing 2221 plasmas

FY 2005 Run completed on September 13, 2005

NSTX Department, Project, Program (M. Ono, M. Peng, E. Synakowski)

- Three members of the NSTX Team participated in the Joint 3rd IAEA Technical Meeting and the 11th International Workshop on Spherical Torus in St. Petersburg, Russia, October 3 - 6, 2005. Martin Peng (ORNL) presented a talk "NSTX results and progress towards CTF". Michael Bell presented a talk "New Capabilities and Results for the National Spherical Torus Experiment". Roger Raman (Univ. Washington) presented two talks "Solenoid-free Plasma Startup in NSTX Using Transient CHI" and "Fueling Requirements for Steady-State Spherical Torus Operation". The meeting was attended by researchers from several laboratories where ST research is carried out, including laboratories in Russia, the UK, Brazil, Japan, China, Italy and the USA. The workshop program included 30 talks and a number of poster presentations. The proceedings will be published by the IAEA. Martin Peng also took some time to attend an ITPA Transport Physics Topical Group meeting, which was also held in the city of St. Petersburg. He presented the progress of a joint 2005-2006 experiment on Internal Transport Barrier Comparison between NSTX and MAST, and participated in the development of a proposal to launch an ITPA study on Momentum Transport, which is of high importance to enabling projections of plasma rotation in ITER. (M. Bell, M. Peng)

- S. Kaye participated in the 10th IAEA Technical Committee Meeting on H-mode physics in St. Petersburg, Russia, from Oct. 28 to 30th 2005. He presented a poster entitled "Role of Aspect Ratio and Beta in H-mode Confinement Scalings", in which the NSTX contributions to the ITPA Confinement Database were used to better establish the aspect ratio scaling of confinement. Scalings derived from all devices and based on engineering variables exhibit an inverse aspect ratio dependence that is stronger than that in scalings based only on conventional and high aspect ratio data. Similar to what was found from statistical analysis of conventional and high aspect ratio, these scalings exhibit an unfavorable dependence on beta when transformed to physics variables. (S. Kaye)

- There will be an NSTX Physics meeting on Monday, Oct. 10 at 1:30 pm in LSB252 (note change of room.) R. Maingi will give an overview of the discharges with enhanced confinement characteristics in NSTX. (S. Kaye)

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

The NSTX outage continued this past week with the removal of the lower TF flag/box assemblies in preparation for the extraction of the TF inner bundle and OH coil planned for early this coming week. A white-plate calibration of CHERS has been performed, and the FARO measuring arm was installed in the vacuum vessel to complete several diagnostic spatial calibrations. Alignments of the moveable glow discharge cleaning probe are in progress and should be completed by the end of next week. One cracked tile was found in the vessel and a replacement is being prepared in the vacuum prep lab.

Access to the NSTX test cell will be available via the card readers throughout this coming week with the exception of some local access restrictions during the TF/OH assembly lift. (A. von Halle)

Research Operations (M. Bell)

Diagnostic Operations (R. Kaita)

- The in-vessel calibrations of the CHERS ion temperature and plasma rotation diagnostic have been completed.
- The in-vessel spatial collaborations for various visible imaging diagnostics, the visible spectrometer, and supersonic gas injector head have been completed.
- An ex-vessel calibration of the fiber optics for the “optical” multicolor X-ray array has been performed. This effort was part of a collaboration with the Johns Hopkins University.
- The “white plate” uniformity calibration has been performed for a fast visible camera used for divertor and wide-angle midplane plasma imaging. This effort was part of a collaboration with Nova Photonics Incorporated.

Boundary Physics Operations (H. Kugel)

- In-vessel spatial calibrations of divertor camera views and various fiberoptic views were completed. The new lower divertor 32-fiber sightlines used in FY05 run with fast filterscopes on loan from General Atomics were spatially calibrated. Spatial calibration of the supersonic gas injector motion probe was verified using the Faro measuring arm. (V.Soukhanovskii, LLNL)
- IR camera calibrations using selected NSTX divertor tiles in a vacuum oven were completed. (R. Maingi, ORNL)
- Spatial calibrations and minor adjustments to the alignment of the MGP were completed, and then MGP was removed for maintenance. (G.Labik)
- The following talks by members of the Joint CDX-U / NSTX Lithium Evaporator

Team were presented at the PPPL Plasma Science and Technology Seminar: "LITER-proto: A Lithium Evaporator Design for Extended Operation and Brief Periods", J. Timberlake; "LITER-proto Characteristics and Performance Off-line and on CDX-U", D.K. Mansfield; "NSTX Plans for LITER-1, Thick Lithium Coating Evaporation", D.K. Mansfield, and H.W. Kugel

- The Purchase Order for the LITER-1 Bellows Motion Drive was awarded. (A.White)