

NSTX Weekly Report (Dec. 9, 2011)

NSTX is in the Upgrade Project outage in FY 2012

Sixteen abstracts have been submitted by members of the NSTX Research Team to the 20th International Conference on Plasma Surface Interactions in Fusion Devices, to be held in Aachen, Germany in May 2012 (<https://www.congressa.de/PSI2012/>). The NSTX contributions include two invited talk abstracts by R. Maingi (ORNL) on “Physics of the H-mode pedestal and its role in setting the power flux channel” and V. A. Soukhanovskii (LLNL) on “Advanced divertor configurations with large flux expansion” as well as fourteen contributed abstracts. The submitted abstracts can be viewed at http://nstx.pppl.gov/DragNDrop/Scientific_Conferences/PSI/2012/. (V. A. Soukhanovskii)

The paper “Recent progress of NSTX lithium program and opportunities for magnetic fusion research”, M. Ono, M. G. Bell, R. Kaita, *et al.*, was published on line in Fusion Engineering and Design (doi:10.1016/j.fusengdes.2011.10.011). This paper reviews the recent progress toward developing fundamental understanding of the NSTX lithium experimental observations as well as the opportunities and associated R&D required for use of lithium in future magnetic fusion facilities including ITER. The paper can be viewed at http://nstx.pppl.gov/DragNDrop/Scientific_Conferences/Lithium_Symposium_2011/. (M. Ono)

NSTX Inboard Midplane Gap Controllability Study - The effectiveness of the NSTX PF coil-set for gap control has been assessed using the recently revalidated system and plasma response models. The assessment was done using a “decoupling” controller, produced by inverting the mapping matrix from coil currents to isoflux errors and plasma current. A key result of the recent model validation process is that the representation of experimental response appears accurate enough to enable reasonable calculation of high order matrix controllers produced using the decoupling approach or other model-based design method. (M.L. Walker, General Atomics)

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

NSTX Upgrade construction activities continued this week with the completion of cable and cable tray removals on the top of the machine, and the installation of an in-vessel platform in support of the machining of a new O-Ring groove in the top flange of the vacuum vessel. The Health Physics group has set up a whole body count trailer outside the test cell in preparation for the vessel cutting/machining operations scheduled to go on for the better part of the upgrade outage. Also this week, the torus vacuum pumping system duct and spool piece were removed, and the neutral beam control racks were permanently moved from the test cell to the adjacent gallery.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center

Research Operations (M. Bell)

Diagnostic Upgrades (B. Stratton)

On December 2, a Final Design Review was held for the vacuum vessel portion of the

modifications to the NSTX Multi-Pulse Thomson Scattering diagnostic needed to accommodate the larger diameter of the new center stack in the NSTX Upgrade. The review was found to be successful pending the resolution of a few minor issues raised in the chits. A Final Design Review for the ex-vessel part of this project will be held next Spring.