

NSTX Weekly Report (August 24, 2007)

FY 2007 NSTX plasma operations completed on June 22, 2007.

Planned: 12 weeks

Completed: 12.63 weeks with 1,879 plasma discharges

- Charles H. Skinner attended the 9th International Colloquium on Atomic Spectroscopy and Oscillator Strengths in Lund, Sweden and gave an invited talk on "Atomic Physics in the Quest for Fusion Energy and ITER" which include his recent work on NSTX. (H. Kugel)
- No NSTX Physics Meeting on Monday, August 27, 2007. (S. Kaye)

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

NSTX In-vessel diagnostic calibrations were completed this week after an alignment test of the MPTS system utilizing the HeNe laser successfully obtained signals on all channels. Also in-vessel, three Faraday shields and antenna straps were removed from the HHFW system to continue inspections of the antennas and feeders. Surface samples from divertor tiles removed from the vessel last week were analyzed on Main Campus using x-ray spectroscopy to evaluate the nature of contaminants introduced during the last run. Tile samples are now being cleaned using various methods ranging from mechanical scrubbing to Nd-Yag laser ablation and will be re-evaluated. Also this week, two of the three neutral beam ion sources were removed for refurbishment, and the third will be removed in mid-September.

The NSTX test cell will be in unrestricted (card reader) access this coming week.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- The LITER_1d drawings were updated and approved.
- The LITER Bay -F upper divertor port cover was removed. Inspection found that the region behind the passive plates exhibited a thin covering of lithium compounds, possibly due to reflection into this region of lithium from the HeGDC. Measurements were performed and used to derive a candidate shutter concept for stopping lithium evaporation into the main vessel during HeGDC and when diagnostic shutters are open.
- Work continued in L-245 to prepare LITER_1d_unit_1 for evaporation for the remaining lithium load and associated tests.
- 28 NSTX graphite tiles from the FY07 experimental campaign were shipped to SNL and received. Work is in progress at SNL to perform ion beam analysis of the tiles for the near surface concentrations of D, Li, B, O, and metals. (W.R.Wampler, SNL)

- Samples were cored from a lower divertor graphite tile exposed in NSTX since first plasma. These samples consisted of 1) virgin material (from the back of the tile), 2) surface material from the exposed front face, and 3) exposed surface material after cleaning with ScotchBrite (the previous cleaning procedure). The samples were analyzed at the main campus Imaging and Analysis Center of the Princeton University Materials Institute for elemental content and surface morphology. A review of the results is in progress.
- A service technician replaced the flash lamps and restored to operation the high power, Nd-YAG laser used previously to test TFTR tile surfaces. The refurbished laser was then used successfully to scan the surface of an NSTX tile for 3 different cleaning tests. The results are awaiting analysis (C. H. Skinner)
- Final testing of the SGI (supersonic gas injector) piezo valve was completed. It was found that a) high flow rates were observed at 125 vdc, 40 to 100 ms at 80 psig He, b) significant flow observed at a minimum of 4 ms 125 vdc, c) voltage as low as 95 vdc can be used with significant flow, but required pulse lengths of at least 100 ms, and d) the probe and piezo valve were successfully leak checked for fill gas leakage at 80 psig He. After the completion of these tests, preparations were started for reassembly of the SGI. (T. Provost, V. Soukhanovskii, LLNL)