

NSTX Weekly Report (July 20, 2007)

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

Planned: 12 weeks

Completed: 12.63 weeks with 1,879 plasma discharges

Charles Skinner and Lane Roquemore attended the EPS satellite workshop on "Dust in Fusion Plasmas" 8-10 July 2007 in Warsaw, Poland. They presented talks and submitted papers on "3-D measurements of dust particle trajectories in NSTX" (Roquemore et al.), "Measuring and controlling surface dust in a tokamak" (Skinner et al.) and "Raman spectroscopy of carbon dust samples from NSTX" (Raites et al.). (C. Skinner)

On Tuesday July 17th, Eugenio Schuster (professor) and his student Majed Alsarheed both of LeHigh University visited the laboratory to discuss plans for M. Alsarheed's Ph.D. research on plasma shape control on NSTX. E. Schuster received a prestigious NSF career award for his proposal to study NSTX shape control in February of this year. On Wednesday July 18th Clancy Rowley and Jeremy Kasdin (professors of Princeton University) visited PPPL. They were accompanied by Egemen Kolemen a Princeton University School of Engineering and Applied Science (SEAS) Ph.D. candidate. E. Kolemen has agreed to undertake a control study of the vertical instability on NSTX as part of SEAS-PPPL collaboration initiative. (D. Gates)

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

The inspection of the interior of the NSTX vacuum vessel was completed this past week, including the removal of wall coupons and representative carbon tiles for surface analysis. Plasma facing surfaces were then swabbed to remove lithium compounds, and the temporary vessel floor installed. The PCHERS shutter was repaired before completing a calibration of that diagnostic's optical system. Also this week, the air purge of the neutral beam in preparation for entry continued, and a design review of upgrades to the diagnostic ground system was held.

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

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- The inspection of the interior of the vacuum vessel was completed. The plasma facing surfaces were swabbed. The floor was installed for additional work.
- Nan Yao (Professor, Princeton University) performed Field Emission Scanning Electron Microscope analysis at the Princeton Imaging and Analysis Center of the Princeton University Materials Institute of a Bay I-J Midplane Silicon Coupon and a Bay F Upper Divertor flake obtained from the local lithium HeGDC buildup near the output of LITER. The K-xray spectrum of the Bay I-J Midplane Silicon Coupon exhibited C, O, Si (coupon) and small amounts of Cr and Fe. No Ti Ni, or Mo were observed. However, the Bay F Upper Divertor flake obtained from the local lithium HeGDC buildup near the

output of LITER exhibited only C, O, and no Si (coupon) and no Cr, Fe, or other metals. This result is consistent with the deposition of typical plasma impurities on the Coupon and HeGDC related local lithium buildup near the output of LITER. In addition the respective morphologies were very different, suggesting different deposition mechanisms.

- A teleconference was held with N. Morley (UCLA) to discuss coordinating the performing of Lithium Liquid Divertor eddy current simulations at PPPL, and simulations at UCLA of liquid lithium motion under applied fields in a porous Mo mesh.

Diagnostic Operations (R. Kaita)

- The new microchannel plate image intensifier and detector for the Johns Hopkins University (JHU) transmission grating (TG) X-ray spectrometer have been received. They will be undergoing tests at JHU in preparation for use in the next NSTX run period.
- Post-run in-vessel calibrations of diagnostics have begun. The “white plate” detector response calibration for the poloidal charge-exchange recombination (P-CHERS) plasma velocity diagnostic has been completed. The “white plate” calibration of the tangential “optical” soft X-ray (tOSXR) diagnostic has started.