

NSTX Weekly Report (October 1, 2010)

FY 2010 NSTX plasma operations completed on September 24, 2010

Planned: Total - 15 run weeks (Base - 14 run weeks, ARRA - 1 run week)

Total completed – 15.43 run weeks and 2941 plasma shots

Completed: Base – 14.42 run weeks and 2770 plasma shots

Completed: ARRA -1.01run week and 171 plasma shots

A Results “Mini-Review” of the 2010 NSTX experimental campaign was held on Sept. 30. Topical Science Group leaders assembled key results of the experimental campaign, along with recommendations for further run time in October to complete the XPs, and made 45 min presentations including discussion. This was merely to serve as an update on the highlights of the run; a more complete Results Review, along with Theory and Modeling results, will be scheduled after the APS meeting. (S. Kaye)

Run Coordination (E. Fredrickson, S. Sabbagh - Columbia University)

Thursday we operated without Lithium Evaporator (LITER). The first half of the day was spent on Kevin Tritz’s XP1013 to collect data on Global Alfvén Eigenmode (GAE) mode amplitudes in shots where electron thermal transport is expected to be enhanced by their presence. The day was very successful with many good measurements of the GAE amplitude and structure evolution with the newly commissioned Beam Emission Spectroscopy (BES) diagnostic. Much further work is needed to interpret these results. Eric Fredrickson’s XP1013 was then revisited to measure the internal structure of Toroidal Alfvén Eigenmode (TAE) modes in H-mode plasmas, an important result this year relying again on the new BES diagnostic. The “Lithium Dropper” was used in this experiment to control plasma density with 50 mg of lithium deposited between shots. The afternoon was spent on Stan Kaye’s XP922 to study the density scaling of the L-H transition. And the last five shots by Lane Roquemore were very low beam power shots (300kW) needed to recalibrate the neutron rate diagnostic.

On Friday, the drsep scan portion of Rajesh Maingi’s XP1043 was finished, successfully completing this experiment. In the afternoon we continued with Steve Sabbagh’s XP1023 to optimize feedback control of the RWM instability, focusing on access to low rotation states. Low rotation at high beta_N was achieved in both fiducial and low li target plasmas, with rotation near $q = 2$ nearly zero in the lowest cases, and core rotation of 7 kHz in the fiducial target plasma.

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

NSTX completed a brief maintenance period this past week, and will resume plasma operations to start the FY11 run on Monday. A review of the design to provide the capability for hot air heating of the four Liquid Lithium Divertor (LLD) plates was held this week, and testing of the air heating system was successfully completed. Also this week, gas injector #3 was replaced and tested.

Access to the NSTX test cell will be restricted during plasma operations this coming week. Access is expected to be available each evening.

Research Operations (M. Bell)

Boundary Physics Operations (H. Kugel)

- Lithium Evaporators (LITER)
 - The LITER-K2 unit supported operations.
 - Planning started for the refill and out-gassing of LITER-K1.
- Molybdenum Inner Divertor Tiles
 - The final machining of the prototype molybdenum plate was completed. Work started on modifying its mating graphite tile..
- Lithium R&D
 - Consultation was provided on NSTX lithium operating procedure to the EAST lithium research program (IPP, Hefei, China).