

## NSTX Weekly Report (July 30, 2010)

### **FY 2010 NSTX plasma operations**

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

**Total completed – 6.82 run weeks and 1265 plasma shots**

**Completed: Base – 5.81 run weeks and 1094 plasma shots**

**Completed: ARRA -1.01run week and 171 plasma shots**

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

On Tuesday July 27, 2010, plasmas operations resumed after an OH lead area insulation repair. Although neon and helium glows had been done in an effort to reduce nitrogen levels, the spectroscopic nitrogen levels were little changed when plasma operations resumed. The XMP68 by Egemen Kolemen to commission plasma operation with the PF4 coil was successfully completed. The PF4 coil current was feedback controlled with Plasma Control System, although some further work to optimize gains is still required. On Wednesday July 28, Ahmed Diallo's XP1044 to study scaling of pedestal heights was finished and Joon Wook Ahn's XP1046 to study the effect of 3-D fields on divertor heat flux profiles was then run. A significant portion of the run plan was finished, but more work on scaling remains to be done. On July 29, Stefan Gerhardt's XP1019 to optimize beta-control was completed. The feedback algorithm is working and will be available for future experiments, subject to the inherent constraints imposed by the ratio of the energy confinement time to the beam modulation timescale. This was followed by XP1023 by Steve Sabbagh to study RWM feedback in low internal inductance plasmas. A low- $I_i$ , high-beta target plasma was developed and feedback with  $B_r$  sensors was demonstrated. The optimal settings for  $n = 1$  RWM control have changed significantly, due to either the change to the new and improved "miu" mode identification algorithm developed by Stefan Gerhardt, the low  $I_i$  plasma, or both.

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

NSTX plasma operations resumed this past week with experiments utilizing lithium evaporation, neutral beam heating, Beta feedback control, and Resistive Wall Mode (RWM) feedback utilizing the Switching Power Amplifier (SPA) driven error field coils. Next week, NSTX will perform an extended period of lithium evaporation, operating the LITER probes around the clock from Thursday through Sunday to provide the needed lithium inventory for a Liquid Lithium Divertor (LLD) experiment scheduled for August 9th.

Access to the NSTX test cell will be restricted this coming week during plasma operations on Monday through Wednesday. Access is expected to be available each evening, and Thursday through Friday during the lithium evaporation.

### **Research Operations (M. Bell)**

#### **Boundary Physics Operations (H. Kugel)**

- Lithium Evaporators (LITER) - The LITERs were used to accelerate the resumption of plasma operations, and XPs 1044, 1046, 1019 and 1023.