

## **NSTX Weekly Report (Sept. 15, 2006)**

**FY 2006 NSTX plasma operations completed on June 23, 2006.**

**Joule Milestone: 11 weeks**

**Achieved: 12.66 weeks**

The paper “Efficient generation of closed magnetic flux surfaces in a large spherical tokamak using coaxial helicity injection” R. Raman (University of Washington) et al. was accepted for publication in Physical Review Letters. The paper reports an efficient production of the closed flux surface carrying a toroidal plasma current up to 150,000 Ampères by Coaxial Helicity Injection (CHI) on NSTX without using a central ohmic solenoid. This results represents a world record for non-inductively generated tokamak plasma current.

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

The NSTX outage continued this past week with the completion of in-vessel machining to provide the apertures for the new Poloidal CHERS diagnostic. Machine tools and scaffolding have been removed from the vessel and the Faro Measuring Arm has been installed. Trail fit-ups of the divertor plates in the vessel will begin next week. Maintenance of diagnostic windows, shutters, and vacuum pumps continues.

The test cell will remain in free (card reader) access through the coming week, only locking up the test cell for short periods of time during electrical testing. Electrical tests are currently scheduled for 11AM to 1PM on Monday for voltage divider calibrations, and 6AM to 7AM on Tuesday for electrical insulation tests.

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

#### **Diagnostic Operations (R. Kaita)**

- Additional memory was added to the data acquisition system for the neutral particle analyzer (NPA). This will enable measurements to be performed with 0.1 millisecond time resolution for 0.8 seconds, which represents a tenfold improvement in the frequency response of the NPA. (S. Medley)
- M. Lawrence of the Lawrence Livermore National Laboratory (LLNL) visited NSTX this week. He installed new detector hardware with PPPL personnel as an upgrade to the LLNL X-ray spectrometer.