

NSTX Update (Feb. 20, 2004)
(M. Ono)

Department, Project, Program (M. Ono, M. Peng, M. Williams, E. Synakowski)

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Run Coordination (S. Kaye, J. Menard)

Two days of operation were devoted to conditioning the RF antenna in double null Helium and Deuterium plasmas. Phasings of 7 m-1 and 14 m-1 were attempted, with RF powers reaching 2 MW, and sustained electron heating up to 2 keV attained with the 14 m-1 phasing. An experiment to probe the locked mode limit at low density was performed with NBI, and good density scan data were obtained. The internal magnetics array was tested for the first time, and these coils showed much faster response and more detail in the rotating modes, as expected. Ohmic H-modes were observed during this, and subsequent experiments. The real-time EFIT control algorithm was implemented and successfully controlled the full plasma evolution during L-H threshold experiments. These experiments were part of an NSTX/MAST similarity comparison of the L-H threshold power in both balanced double null and single null plasmas, and rtEFIT was successful in reproducing as closely as possible, the MAST shape in NSTX. NSTX results corroborated those of MAST; the balanced double null plasma had the lowest threshold (~350 kW of NBI, similar to the MAST value), while the power thresholds for the single null cases was much higher. (S. Kaye)

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

• NSTX operations continued this week, with experiments on producing high-beta toroidal at high normalized current by increasing the plasma elongation (XP421), and further investigations into high beta normal (XP414). Fast-ion distribution during neutral beam injection was measured with the Neutral Particle Analyzer (XP417) and experiments were started to produce long pulse high beta plasmas (XP432). Control cabling and the gas line electrical break for the new Lithium Pellet Injector were installed during the evening shifts this week, and pressure testing of the gas delivery system was completed.

Focus will shift to HHFW experiments this coming week, and the neutral beam will be warmed up to repair the guide bearing on the calorimeter mechanism. During this week, the test cell will be in restricted access during 1st shift, with test cell access available from approximately 5:00PM to 10:00PM each evening. The next maintenance week is scheduled for March 8th - 12th.

Quality Assurance (J. Malsbury)

QC performed weld inspections for the LPI instrumentation.

Research Operations (M. Bell)

Physics Operations (D. Mueller)

Boundary Physics Operations (H. Kugel)

- The fast RGA data acquisition time has been extended to $t = 45\text{s}$ by reordering the sequence of events before the helium glow. This will enable a correlation to be made between outgassing of hydrocarbon radicals after the discharge, and deposition recorded by the deposition monitor. (C. Skinner, R. Gernhardt)
- The Lithium Pellet Injector (LPI) cable terminations in the NTC were completed. The high pressure gas lines were pressure tested successfully. The LPI unit passed a leak test, was evacuated, and its bakeout system was operated to 100°C .
- Candidate parts were located for use with the Supersonic Gas Injector/Edge Magnetic Probe system, and preparations started for performing flowmeasurements. The Magnetic Sensor coils were prepared for welding of the field leads.

Diagnostic Upgrades (D. Johnson)

- First light was seen by the ultra-fast tangential x-ray pinhole camera in the initial debugging phase, satisfying a February diagnostic milestone to install this system.