NSTX-U

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NSTX-U Team Meeting

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and the NSTX Research Team

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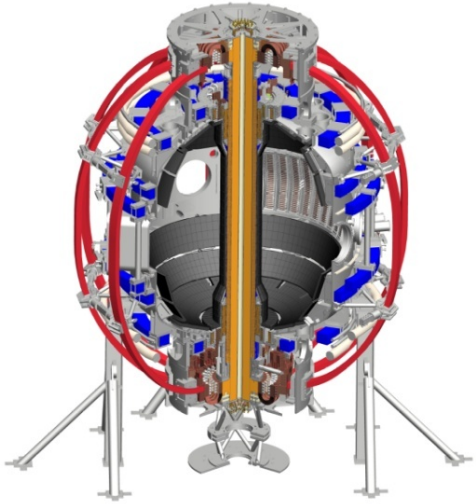

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Topics

- Diagnostics
- RF
- Boundary Physics / PFCs
- Physics Operations

Diagnostics (I)

- All the major port covers are now on the machine.
- In-vessel parts for sFLIP have been installed.
- SAMI (Synthetic Aperture Microware Imaging) shutter has been installed.
- In the final stages of assembling and fitting up the SSNPAs.
- Nearly complete with drawings for interface flange/bellows/gimbal sections for SPRED/DIR.
- Divertor Tangential Imaging diagnostic drawings are with two vendors for quotation.
- Design of stand, pumping system, and other services for three EUV spectrometers (LLNL) at Bay E complete.
  - Plan to install after RF waveguides are installed (late September)
- Areas outside of NSTX-U Test Cell identified for new lasers
  - NSTX high-k source enclosure can accommodate FIReTIP and high-k lasers with waveguides using existing penetration.
  - New Laser Blowoff (LBO) impurity injector to be positioned over shielding blocks covering entryway from South High Bay.
- Allocating the space on bays J and I is the more pressing non-MPTS diagnostic task.

Diagnostics (II)

- MPTS:
  - Laser beam path through vacuum vessel established
  - Assembly of laser input flight tube and stand in progress
  - Will mount optical table and box on south wall soon
  - Drawings for laser exit hardware 98% complete and fabrication of parts has started
  - Testing and final assembly of modified Collection Optics Box is being completed
  - Testing of alignment TV cameras in progress
  - Phase 3 polychromators being rebuilt to improve their performance.
- On July 15 2014, a peer-review of the Pulse-Burst Laser system was held at PPPL with the Physical Science Laboratory at the University of Wisconsin – Madison
  - Review covered the detailed conceptual design of this system
    - which includes the power supplies for the flashlamps,
    - the control of the laser head (with expected rep rates),
    - the control of these power supplies
  - The review was deemed acceptable, with minor chits that will be examined.

RF Operations

- The HHFW antenna is now installed inside NSTX-U, with the full set of compliant center conductors.
  - Next step is to to install the transmission line/matching system to power the antenna.
- The coaxial Langmuir probes for simultaneously measuring I-V characteristics and RF voltage are installed at Bay J top and bottom.
  - Beginning to design the electronics for these probes.
- RF Physics
  - The heating efficiency improvement expected for NSTX-U is being presented in a paper at the US-Japan RF Physics Workshop in Kyoto next month by Nicola Bertelli entitled "High Harmonic Ion Cyclotron Heating Efficiency in NSTX and NSTX-U".
  - A case is made at the same workshop by Joel Hosea that the RF heating spiral on the divertor in NSTX could be caused in large part by RF rectification in a paper entitled "Case for RF rectification at the RF heating spiral produced on the divertor of NSTX".

Boundary Physics Operations

- NSTX-U Lithium Technology Development Laboratory - C128
  - Glove box and new fume hood fully operational
  - New chemistry hardware ordered (oven, dessicator, glassware, etc.)
  - New lithium handling procedures being developed
- Materials Analysis and Particle Probe – MAPP
  - Remote control development and testing on LTX nearly complete for X-ray photoelectron spectroscopy (XPS), thermal desorption spectroscopy (TDS), and ion source for depth profiling
  - Procedures and schedule for installation on NSTX-U in preparation
- PDR for a new boronization system will be held on Monday.

Physics Operations

- Peer review for the CS massive gas injector was held on 8/7/2014.
  - Some meaningful chits, but work is progressing.
- Operational impacts of the aquapour/CTD-425 composite being assessed. For instance:
  - Analysis division working to assess the recommended level of TF/OH temperature differential.
  - Determining the most practical ways to maintain the required TF/OH temperature difference.
  - Developing protection algorithms in DCPS.