NSTX-U Weekly Report (May 2, 2014)

NSTX-U is in the Upgrade Project outage in FY 2014

A paper entitled "Calculation of neoclassical toroidal viscosity with a particle simulation in the tokamak magnetic braking experiments" by Kimin Kim (PPPL) et al. has been published in Nuclear Fusion 54 (2014) 073014, and is available online at http://stacks.iop.org/0029-5515/54/073014. The paper describes numerical verification of fundamental neoclassical toroidal viscosity (NTV) physics, such as collisionality dependency, field resonance, and mode coupling, and experimental NTV analyses in DIII-D and NSTX using delta-f guiding-center particle code POCA. The paper presents that particle simulation is useful to validate NTV theories, investigate new physics, and improve the prediction of toroidal rotation damping by 3D magnetic field in tokamaks. (K. Kim)

Gary Taylor (PPPL) attended the 18th Joint Workshop on Electron Cyclotron Emission and Electron Cyclotron Resonance Heating (EC-18) that was held in Nara, Japan, April 22-25. He presented a paper entitled "A megawatt-level 28 GHz heating system for the National Spherical Torus Experiment Upgrade". Gary also chaired a session on non-inductive plasma start-up with electron cyclotron and electron Bernstein wave heating. (G. Taylor)

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

NSTX Upgrade activities continued with the ongoing winding of the new OH coil's 4th and final layer of conductor. Electrical insulation testing of the completed PF1B Lower coil was successfully performed, and that coil is ready to be installed on the CS casing once lift fixtures to rotate the CS casing are prepared. The new PF1A Lower coil has arrived at PPPL from the manufacturer's facility. In the NSTX-U test cell, the final entry into NB2 to clean/close the beam box in preparation for pump-down was completed. The first of the three NB2 transmission lines has been arranged in position in the test cell and connected to the High Voltage Enclosure (HVE).

Development of the new Digital Coil Protection System (DCPS) continued this week with testing of the completed software and the design of hardware and I/O layouts.

Preparations for plasma operations in the NSTX-U configuration also continued with the preparations of the Field Coil Power Conversion (FCPC) and Neutral Beam Power systems for upcoming power testing. Commissioning of the new TF and OH PLC based fault relaying system continued, and a contractor has completed the maintenance of the neutral beam deionized cooling water skids. The FCPC cooling water pump is scheduled to repaired and back on site on May 19th. A contract is now in place to support the D-MG #1 weld repairs and the welding contractors are scheduled to be on site next week.

Access to the NSTX test cell will be available only through previous arrangement with the Upgrade Work Control Center.