

**The PPPL Highlights for the week ending December 30, 2016 are as follows:**

**NSTX-U RECOVERY PROJECT (R. HAWRYLUK):**

Progress was made on the development of NSTX-U System Design Descriptions (SDD's), and several drafts have been made available for review, which were performed.

Dates for upcoming Design Validation and Verification Reviews (DVVR's) are under consideration pending the availability of external reviewers.

The PPPL Operations Center remained open this week scanning completed run copies of installation and pre-operational test procedures to be used as support documentation for the SDD's.

**NSTX-U RESEARCH (J. MENARD):**

Several NSTX-U researchers began providing initial comments on draft NSTX-U System Design Descriptions and Project Design Description documents for upcoming Design Validation and Verification Reviews.

**ITER & TOKAMAKS (R. NAZIKIAN):**

**International:**

To simplify integration of the C-Mod MSE polychrometer on KSTAR, all control and analysis software has been ported to a dedicated Linux workstation. This week, the analysis software suite was successfully operated on the workstation in stand-alone mode. The next step is to disassemble the polychrometer in the first week of January in preparation for shipment to NFRI/KSTAR. The workstation will be shipped to NFRI along with the polychrometer hardware.

R. Nazikian visited the SouthWestern Institute of Physics in Chengdu to present recent results on the ELM suppression using 3D fields and to discuss ideas for optimizing the design of the ELM control coils on HL-2M.

### **DIII-D:**

The new prototype for the Impurity Granule Injector (IGI) feeder was successfully tested with Lithium. The range of drop rates for 700 micron spheres is 1-160 Hz. There were no bridge instabilities or jams, unlike with the previous feeder mechanism. The feeder ran for 2 minutes continuously at 100Hz before running out of granules. The new feeder will significantly improve on the reliability and regularity of ELM pacing compared to the previous design.

A. Nagy attended remotely the NSTX-U all-hands engineering meeting. After the meeting Nagy suggested the use of impulse testing for coil qualification as a routine procedure. This is similar to the practice on DIII-D. He sent the circuit diagram, procedure and sample waveforms to PPPL engineering for further discussion.

### **ADVANCED PROJECTS (H. NEILSON):**

#### **Stellarators (D. Gates):**

Zhichen Feng, a post-doctoral researcher at Zhejiang University, located in Hangzhou China, is visiting PPPL for 6 months. David Gates is his host. The goal of his visit is to learn stellarator codes such as TERPSICHORE and STELLOPT and to do a research project in the area of stellarator configuration/coil optimization. Dr. Feng works for Dr. Guo-Yong Fu who has a joint appointment at Zhejiang University and at PPPL. Dr. Feng's previous research includes calculations of particle transport driven by electrostatic turbulence and numerical solutions to the Poisson equation.

This report is also available on the following web site:  
<http://www.pppl.gov/publication-type/weekly-highlights>