

NSTX-U Weekly Report (December 1, 2017)

FY 2018 status: NSTX-U is in a maintenance and repair outage.

Recovery

A Preliminary Design Review (PDR) for the Center Stack Cooling Tube/Heat Transfer Plate (HTP) was completed on November 30, 2017. A Preliminary Design Review (PDR) for the High Temperature Helium System (HTHS) Feed-throughs was completed on December 1, 2017. For the PF coils, the automated Co-winding and Inspection System has been installed and tested. Operating Procedure development and training for the system is underway.

Research

On Monday November 27 Jon Menard gave an NSTX-U physics meeting presentation on preparation for the next NSTX-U PAC-39 meeting to be held January 9-10, 2018 at PPPL. Presentation materials are downloadable from [here](#).

On Tuesday November 28 Doohyun Kim (PPPL) gave an NSTX-U/I&T physics meeting presentation entitled "ORBIT modelling of fast particle redistribution induced by sawtooth instability." Initial tests on NSTX-U show that introducing energy selectivity for sawtooth (ST) induced fast ion redistribution improves the agreement between experimental and simulated quantities, e.g., neutron rate. Thus, it is expected that a proper description of the fast particle redistribution due to ST can improve the modeling of ST instability and interpretation of experiments using a transport code. In this work, we use ORBIT code to characterize the redistribution of fast particles. From ORBIT simulations, we find suitable amplitudes of the perturbed magnetic fields for each ST crash to reproduce the experimental results. The comparison between the simulation and the experimental results will be discussed, as well as the dependence of the fast ion distribution on fast ion phase space variables (i.e., energy, magnetic moment and toroidal angular momentum).