

NSTX-U Weekly Report (October 28, 2016)

FY 2017, NSTX-U is in the maintenance and repair outage.

Three NSTX(-U) Press Releases were chosen and posted to the APS-DPP Virtual Press Room for 2016. The first, "A Disappearing Feast: Mean Flows Remain Slim After Eating Eddies", represents work by Ahmed Diallo and Tim Stoltzfus-Dueck, showing that the energy flow dynamics just prior to the L-H transition in NSTX is not consistent with those in the predator-prey model, with energy flowing from mean flow to turbulence in NSTX, rather than in the opposite direction as in the predator-prey model. Furthermore, the work shows that thermal energy fluctuations, which are not taken into account in the predator-prey model, are actually dominant. The second, "Launching Fusion Reactions Without a Central Magnet, or Solenoid" highlights the work of Fatima Ebrahimi, who performed resistive, 3D non-linear simulations to explore the plasmoid instability and its role in the production of non-inductive current through Co-Axial Helicity Injection. The third, "Steering a Fusion Plasma toward Stability", highlights the work of Jack Berkery and Steve Sabbagh in developing a Disruption Forecasting Algorithm (DECAF), and in developing a reduced model for Resistive Wall Mode stability. The reduced model is implemented in DECAF and can robustly predict the destabilization of this mode, which can lead to a disruption. Early detection of the mode can trigger actuators that will enable active RWM stabilization. (S. Kaye, PPPL)

Engineering Operations (A. von Halle, P. Titus)

Preparations for the removal of the NSTX-U Centerstack continued this past week with work outside the vessel. Machine technicians and Health Physics (HP) staff have completed in-vessel clean-up, and the in-vessel preparations for the centerstack removal will begin upon completion of HP surveys. Work also continued on the recommissioning of the coil winding facility this week with the reassembly of the oven, and the preparations for a heat run. Good progress was made on neutral beam #2 calorimeter maintenance with the replacement and testing of the calorimeter "Vee" (beam target) guide bearings.

Access to the NSTX-U Test Cell is expected to be available for approved work this coming week.

The damaged PF1aU coil has been cut into three sections, with two removed from the mandrel. Electrical insulation/continuity, borescopic examination of all cooling channels and vacuum leak check testing has been completed for all three segments, and forensic analysis continues. (I. Zatz, PPPL)