

## **NSTX-U Weekly Report (December 13, 2013)**

### **NSTX-U is in the Upgrade Project outage in FY 2013**

A paper "Characterization of divertor footprints and the pedestal plasmas in the presence of applied  $n=3$  fields for the attached and detached conditions in NSTX" by J-W. Ahn (ORNL) et al. has been published in Plasma Physics and Controlled Fusion 56 (2014) 015005, and is available on line at <http://iopscience.iop.org/0741-3335/56/1/015005>. The paper describes recent progress in the study of 3-D field effects on the divertor and pedestal plasmas with the use of a new set of diagnostics. A high speed, wide angle visible camera provides 2-D data of lower divertor surface covering almost the full range of radius ( $r$ ) and toroidal angle ( $\Phi$ ). The spatial distribution of connection lengths ( $L_c$ ) calculated by vacuum field line tracing for  $n=3$  fields agrees with the footprint pattern observed in the 2-D wide angle camera images. The image data show that the phase locking of ELM footprints to the applied  $n=3$  fields has dependence on the ELM size. The 3-D fields can re-attach detached divertor plasma, which is associated with the rise of pedestal  $T_e$ . Profile measurements and TRANSP analyses show that this is likely to be dominated by a change in the electron thermal transport processes. (J-W. Ahn)

R. Maingi (PPPL) represented NSTX-U at the ITPA Coordinating Committee meeting Dec. 9 - 11, 2013 in Cadarache, France. He also presented a talk summarizing the annual activities and joint experiment proposals for the ITPA Pedestal and Edge Physics group, for which he serves as chair. (R. Maingi)

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

NSTX Upgrade activities continued with the ongoing preparation of the OH winding system. Tuning of the OH winding taping heads has been completed, and OH conductor pulled through the pivot beam and to the TF bundle. The TF centerstack casing has been moved to the high bay adjacent to the test cell and is being prepared for the mounting of tiles and diagnostics. The fourth and final in-vessel neutral beam armor quadrant is in the final stages of assembly and will be installed in the vessel next week.

Preparations for plasma operations in the NSTX-U configuration also continued with the installation of new fiberoptic patch panels in the TF wing of the Field Coil Power Conversion (FCPC) Building. Control power testing of the installed new FCPC firing generators continues. A Preliminary Design Review of the new Stand Alone Digitizer (SADII) system for the plasma diagnostics is scheduled for this coming Thursday.

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