

NSTX-U Weekly Report (Feb. 15, 2013)

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

An article "Stochastic loss of neutral beam ions from NSTX during toroidal Alfvén eigenmode avalanches," by D. S. Darrow (PPPL) et al., was published in Nuclear Fusion in January as Nucl. Fusion 53 [\(2013\) 013009](#). This paper compares measurements and guiding center orbit code modeling of neutral beam ion loss during these bursting avalanche events which sometimes occur in NSTX plasmas. Recent developments in the PPPL guiding center orbit code ORBIT have allowed mapping of the stochastic domains in the beam ion phase space induced by MHD modes such as these TAE avalanches. Such mapping, using the measured eigenmode structures in the observed bursts, shows the bursts can affect simultaneously both ranges of passing and trapped orbits, with fair agreement with the measured losses. This adds a useful technique for analysis of the effects of MHD on fast ion confinement in future devices. (D.S. Darrow)

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

NSTX Upgrade construction activities continued this week with a fit-up of the new new Bay L Nozzle for the MPTS diagnostic. Nine TF inner conductors have been fully aligned in the first inner TF quadrant mold, and that mold has been moved into the oven in preparation for epoxy vacuum impregnation (VPI) scheduled for next week.

Preparations of non-upgrade equipment for plasma operations in the NSTX-U configuration also continued with the ongoing fabrication of the new field coil power conversion (FCPC) system firing generators, and the controls testing of Production unit #1 in a FCPC rectifier.

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