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Effect of Sawtooth crashes on fast-ion distribution in NSTX-U DEYONG LIU, W. W. HEIDBRINK, G. Z. HAO, UC Irvine, M. PODESTA, E. D. FREDRICKSON, D. S. DARROW, PPPL — During the 2016 experimental campaign of NSTX-Upgrade (NSTX-U), long L-mode and reproducible sawtoothing plasmas have been achieved that were previously not accessible on NSTX. This provides a good opportunity to investigate the conditions of sawtooth appearance and to study their effects on fast ion confinement and re-distribution in spherical tokamaks. The Fast-Ion D-alpha (FIDA) and Solid State Neutral Particle Analyzer (SSNPA) diagnostics on NSTX-U each has two subsystems with one subsystem more sensitive to passing particles and the other one more sensitive to trapped particles. It has been observed on both diagnostics that the passing particles are strongly expelled from the plasma core to the plasma edge during sawtooth crashes while trapped fast ions are weakly affected. The tangential-FIDA (t-FIDA) system which is most sensitive to passing particles saw a signal drop in the region inside the inversion radius (˜125cm), while an increase at the outer region. The neutron rate can drop as much as 13% during sawtooth crashes. This phenomenon is similar to previous observations in DIII-D and ASDEX Upgrade conventional tokamaks. Detailed data analysis and modelling are being performed to quantity the effects of sawtooth crashes on fast-ion redistribution and to compare with the Kadomtsev sawtooth model. **Work supported by US DOE.*

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