Abstract Submitted
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Simulations of DIII-D Sawtooth Oscillations Using Theory-Based Transport and Sawtooth Models[1] Y.M. JEON, ORISE, G. LI, Q. REN, W. GUO, ASIPP, L.L. LAO, H.E. ST. JOHN, M.S. CHU, R. PRATER, GA, J.M. PARK, ORNL — Development and validation of a predictive sawtooth model is an important research topic for present-day tokamaks and ITER. Analysis using ONETWO to model the DIII-D sawtooth behavior due to the interactions between FW and NBI fast ions, predicts the observed reduction in the axis safety factor q_0 due to current profile evolution. Preliminary analysis indicates that the predicted drops in q_0 within a sawtooth cycle follow closely the experimental values from the EFIT code using MSE data. In ONETWO simulations, the evolution of q_0 within a sawtooth period is modeled with neoclassical resistivity and the experimental density and temperature profiles in two neighboring giant sawtooth cycles. Initial analysis using the Kadomtsev sawtooth model indicates that the sawtooth crash can be qualitatively reproduced with an appropriately chosen triggering parameter. The Porcelli sawtooth model is being implemented into ONETWO to more comprehensively predict the sawtooth crash.

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