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Prediction of Sawtooth Periods in Fast-Wave Heated DIII-D Experiments Using Extensions of the Porcelli Model,* A.D. Turnbull, M. Choi, L.L. Lao, V.S. Chan, M.S. Chu, *General Atomics*; Y.M. Jeon, ORISE; G. Li, Q. Ren, *ASIPP*; N. Gorelenkov, *PPPL* – Validation of a predictive sawtooth model is important for burning plasma experiments such as ITER. The Porcelli model using simplified expressions for the key contributions has been found to predict average sawtooth periods reasonably well in existing tokamaks. We evaluate this model using realistic models for the ideal MHD contribution from GATO, and a nonisotropic fast ion contribution using ORBIT-RF and TORIC for the rf-modified fast-ion pressure. Application to the first giant sawtooth cycle in a DIII-D discharge where beam ions accelerated by fast waves modify the sawteeth shows the model can predict the crash time consistent with the experimental crash. The stabilizing contributions depend strongly on uncertainties in the magnetic shear at q=1 and the fast ion poloidal beta. The model will be also applied to other sawteeth in the same discharge and compared to predictions from the more complete NOVA-K stability code with full anistropy.

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