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Category Number and Subject:

Theory     Experiment

**Internal Kink Stability and Its Relation to Tokamak Sawteeth,\*** A.D. Turnbull, M. Choi, L.L. Lao, *GA*, E.A. Lazarus, *ORNL*, N. Gorelenkov, *PPPL* – Analysis of sawtooth cycles using the Porcelli model [1] for specific DIII-D discharges shows that several features of the stability do not follow the conventional picture. Notably, the ideal stability does not necessarily degrade during the ramp as the axis  $q$  drops. Instead, the stabilizing contributions are weakened largely due to the changing equilibrium conditions. The Porcelli and NOVA-K [2] models are compared against the experiments. The fast particle stability contribution from NOVA-K is sensitive of varying pitch angle distribution. Yet, using reconstructed equilibria, the simpler Porcelli model yields results in agreement with experiment. This is investigated by studying the dependence of the NOVA-K results on the distribution. Accurate modeling of the actual fast ion distribution is key and a method for obtaining this from the limited statistics of a Monte-Carlo simulation is described.

[1] F. Porcelli, et al., *Plasma Phys. Control. Fusion* **38** (1996) 2163.

[2] C.Z. Cheng, *Physics Reports* **211** (1992) 1.

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