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Numerical Simulation of Giant Sawteeth in Tokamaks using the NIMROD Code[1] D.D. SCHNACK, University of Wisconsin, S.E. KRUGER, TechX Corp., C.R. SOVINEC, University of Wisconsin, C. KIM, University of Washington, A.D. TURNBULL, General Atomics — It is well known that a minority population of energetic particles can stabilize the $n = 1$ sawtooth mode in tokamaks even when the on-axis safety factor is well below unity [1]. When destabilized, the resulting crash can lead to degradation of confinement, the generation of NTM and ELMs, and a significant loss of stored energy. Extensive linear studies have been performed recently to analyze the sawtooth activity in DIII-D discharge #96043 through a sequence of equilibria reconstructed from experimantal data [2]. The results were consistent with the observed sawtooth crash. Here we begin a computational study of the non-linear consequences of the crash of a giant sawtooth using the NIMROD Extended MHD code [3]. Two sets of calculations are considered. The first is a model toroidal equilibrium; the second is the series of equilibrium reconstructions considered in Ref. 2. Initial linear results for both MHD and extended MHD, including energetic particle effects, are presented. 1. R. B. White, P. H. Rutherford, and P. Colestock, Phys. Rev. Letters **60**, 2038 (1988); D. J. Campbell, D. F. H. Start, J. A. Wesson, et al., Phys. Rev. Letters **60**, 2148 (1988). 2. M. Choi, A. D. Turnbull, V. S. Chan, et al., Phys. Plasmas **14**, 112517 (2007). 3. C. R. Sovinec, et al., J. Phys. Conf. Ser. **16**, 25 (2005).

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