Abstract Submitted for the DPP05 Meeting of The American Physical Society

Testing the Porcelli Sawtooth Trigger Module G. BATEMAN, A.H. KRITZ, Lehigh University, Bethlehem, PA, USA, M.F.F. NAVE, Associação EURATOM/IST, Centro de Fusão Nuclear, Lisbon, Portugal, V. PARAIL, Euratom/UKAEA, Culham Science Centre, Abingdon, UK, EFDA JET CONTRIB-UTORS TEAM — The Porcelli sawtooth trigger model [1] is implemented as a module for the National Transport Code Collaboration Module Library [2] and is tested using BALDUR and JETTO integrated modeling simulations of JET and other tokamak discharges. Statistical techniques are used to compute the average sawtooth period and the random scatter in sawtooth periods obtained during selected time intervals in the simulations compared with the corresponding statistical measures obtained from experimental data. It is found that the results are affected systematically by the fraction of magnetic reconnection during each sawtooth crash and by the model that is used for transport within the sawtooth mixing region. The physical processes that affect the sawtooth cycle in the simulations are found to involve an interaction among magnetic diffusion, reheating within the sawtooth mixing region, the instabilities that trigger a sawtooth crash in the Porcelli model, and the magnetic reconnection produced by each sawtooth crash. [1] F. Porcelli, etal., Plasma Phys. Contol. Fusion 38 (1996) 2163. [2] A.H. Kritz, et al., Comput. Phys. Commun. 164 (2004) 108; http://w3.pppl.gov/NTCC. Supported by DOE DE-FG02-92-ER-54141.

> Glenn Bateman Lehigh University

Date submitted: 26 Jul 2005

Electronic form version 1.4