Abstract Submitted
for the DPP11 Meeting of
The American Physical Society

**Validation of RWM Kinetic Stability Model and Physics Implications in NSTX** J. BIALEK, J.W. BERKERY, S.A. SABBAGH, Columbia University, R. BETTI, R.E. BELL, A. DIALLO, S.P. GERHARDT, B.P. LEBLANC, J. MANICKAM, M. PODESTA, PPPL — The resistive wall mode (RWM) instability may limit the promise of disruption-free operation in future tokamaks unless a reliable stabilization mechanism is found. Kinetic effects in the plasma can passively stabilize the mode by dissipating its energy. The change in potential energy by kinetic effects is calculated for experimental plasma equilibria with the MISK code. Further improvements of the theoretical model are presently being investigated to refine the quantitative agreement between computed RWM marginal stability points and experimental results. These include the role of collisions in both dissipating the mode energy and also in damping the resonant kinetic effects, and the inclusion of anisotropy of neutral beam injected energetic ions to correctly account for their stabilizing effects on RWM stability. Recent experiments in NSTX with reduced plasma internal inductance that have decreased RWM stability are consistent with MISK calculations. These kinetic stability calculations are being benchmarked through comparison with the results of other codes such as MARS-K and HAGIS. The implications of this physics for the stability of future devices, such as ITER, are also discussed. *Work supported by U.S. DOE contracts DE-FG02-99ER54524, DE-AC02-09CH11466, and DE-FG02-93ER54215.

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Date submitted: 26 Jul 2011 Electronic form version 1.4