Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Critical Toroidal Rotation Profile for Resistive Wall Modes in Tokamaks[1] K.C. SHAING, University of Wisconsin, S.A. SABBAGH, Columbia University, M. PENG, Oak Ridge National Laboratory — It is known experimentally and theoretically that resistive wall modes in tokamaks can be stabilized by toroidal plasma rotation. The critical toroidal rotation speed is usually a small fraction of the toroidal Alfven speed based on several theories. It is reduced when the enhanced plasma inertia is included in the polarization current density. Besides the usual safety factor dependence, the reduction factor depends on the aspect ratio when neoclassical dissipation is taken into account. The critical toroidal angular frequency is few kHz in the edge region for typical large tokamaks. Here, a model is developed to calculate the critical toroidal rotation profile. This is accomplished by including neoclassical dissipation and its corresponding inertia enhancement at each rational surface.

[1]This work was supported by US Department of Energy under Grant No. DE-FG02-02ER54679.

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Date submitted: 26 Jul 2005 Electronic form version 1.4