Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Study of microtearing mode in NSTX with GEM JUGAL CHOWDHURY, YANG CHEN, SCOTT PARKER, WEIGANG WAN, University of Colorado, JOHN CANIK, Oak Ridge National Laboratory, WALTER GUTTENFELDER, DAVID SMITH, Princeton Plasma Physics Laboratory — Anomalous thermal transport of electrons in conventional and spherical tokamaks is believed to be driven mainly by electron temperature gradient modes, and trapped electron modes. Another mode which is electromagnetic and sensitive to collisionality has emerged as another source of electron thermal loss. Earlier it has been believed that this instability is important only for spherical tokamaks both in core (Guttenfelder et al. Phys of Plasmas 19, 022506 (2012), as well as edge pedestal region (Dickinson et al., Plasma Phys. Control. Fusion 55 (2013) 074006). However, recent results indicate that it can equally affect the electron thermal loss in conventional tokamaks (Moradi et al., Nucl. Fusion 53 (2013) 063025)) also. The mode is characterized by the even parity in $A_{\|}$, and grows on the free energy provided by the electron temperature gradient. In the present work we will carry out a gyrokinetic study of the microtearing mode for NSTX parameters and compare properties of the mode in the core and edge using the nonlinear gyrokinetic electromagnetic code GEM. The scaling with collisionality in the two regimes will be studied. A preliminary comparison of the microtearing mode in local flux tube and global model of GEM will also be presented.

Weigang Wan
University of Colorado

Date submitted: 10 Jul 2013 Electronic form version 1.4