Abstract Submitted
for the DPP16 Meeting of
The American Physical Society

Gyrokinetic simulation and analytic modeling of dissipative trapped electron mode in tokamak edge CHEN ZHAO, YONG XIAO, Zhejiang Univ — Trapped electron mode (TEM), including collisionless TEM (CTEM) and dissipative TEM (DTEM), are major electrostatic candidates accounting for electron turbulent transport in tokamaks. The interests on DTEM have recently been re-invoked by the so called edge coherent mode" in EAST experiments. Due to the low temperature in the pedestal region, DTEM may play an important role in electrostatic edge transport. In this work, we revise the previous DTEM theory by using a more realistic pitch angle scattering operator for collisions in the edge and the analytic result is further compared by the gyrokinetic simulation code GTC with a more complete collisional operator conserving both energy and momentum. The dependences of the DTEM instability on wavelength and collisional frequency are revealed by both simulation and theory and show good consistency between them. The linear growth is stabilized in the long wavelength limit, which is different from some of the previous studies, while consistent with traditional CTEM picture. The nonlinear wavelength cascade of DTEM is investigated by gyrokinetic simulation and will be reported in this presentation.

Chen Zhao
Zhejiang Univ

Date submitted: 20 Jul 2016 Electronic form version 1.4