TH/P2-32 Summary: Gyrokinetic Simulation of Tokamak Edge Plasmas

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- EAST tokamak (shot # 38300) observed an electrostatic electron coherent mode (ECM) with characteristic frequency $\omega = 30 \sim 40 kHz$ Wang & Xu 2014 PRL
- The global gyrokinetic particle code GTC is employed to study ECM by using the realistic EAST plasma parameters and equilibrium magnetic field, and find an unstable TEM mode propagating in the electron diamagnetic direction
- The experimental frequency is recovered by simulation at the experimental toroidal mode number n=17
- Linear real frequency staircase is found, corresponding to different branches of the eigenmode in the edge; Linear growth rate increases with poloidal wavenumber.
- Collisions are found to play a minor role on the growth rate
- The instability is mainly driven by electron density gradient.