Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

The boundary effects on tokamak edge instabilities WEIGANG WAN, SCOTT PARKER, YANG CHEN, University of Colorado — Tokamak edge instabilities are extremely difficult to model with gyrokinetic simulation because of the strong pressure gradients and the sensitivity to the magnetic equilibrium near the x-point. Our previous global simulations have assumed fixed radial boundary conditions with the simulation domain inside the last closed flux surface, i.e. the separatrix. The pressure profiles have to be smoothed near the boundary. Although it is typical that edge instabilities peak inside the separatrix, these restrictions may affect the physical results. Here, we extend the simulation domain into the scrape-off layer, still assuming closed flux surfaces, and keep the original density and temperature profiles to study any possible boundary effects in the previous model. With the newly implemented general magnetic equilibrium in GEM (rather than Miller parametrization), this model is even more realistic. Simulations are carried out using direct experimental parameters of recent DIII-D discharges.

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Date submitted: 10 Jul 2014 Electronic form version 1.4