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The effects of the magnetic equilibrium on tokamak edge instabilities WEIGANG WAN, YANG CHEN, SCOTT PARKER, University of Colorado — The general magnetic equilibrium of the "full" geometry is implemented in the global gyrokinetic turbulence code GEM.[1] A mapping between the experimental coordinate (R, Z) and the simulation coordinate (r, θ) is calculated directly from the EQDSK file generated by the EFIT analysis. Tokamak edge simulations are carried out with general geometry. At the edge, the general magnetic equilibria differ significantly from that parametrized by the Miller equilibrium,[2] and this difference has quantitative effects on the linear instabilities of the kinetic peeling ballooning mode and the kinetic ballooning mode found in our previous studies.[3] The growth rates are quite sensitive to the magnetic equilibrium, especially with the Miller quantities of elongation and triangularity. Additionally, the calculation of the safety factor has great uncertainty near the separatrix, and this uncertainty may have important effects on tokamak stability.

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[3]W. Wan, S. E. Parker, Y. Chen, Z. Yan, R. J. Groebner, and P. B. Snyder, Phys. Rev. Lett. **109**, 185004 (2012).

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