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Gyrokinetic Particle Simulation of Alfven Eigenmodes with Zonal Fields[1] ZHIXUAN WANG, University of California, Irvine, GTC TEAM TEAM — Effects of collective Shear Alfven wave instabilities on the energetic particle confinement in tokamak depend ultimately on the nonlinear evolution of the turbulence with spontaneously generated zonal fields (zonal flows and zonal currents). In this work, we study nonlinear interaction of Alfvén eigenmodes with zonal fields using global gyrokinetic toroidal code GTC. Linear electrostatic simulations in the cylindrical geometry showed that ion temperature gradient instability is observed to be suppressed when ExB flow shear is strong enough. A good agreement has also been achieved between our simulation result of kinetic Alfvén wave and LAPD experimental result. Now we are doing TAE (torodicity-induced Alfvén eigenmodes) simulation using the DIII-D equilibrium data. Linear simulation results agree well with experimental data. Nonlinear results will be shown, including frequency chirping and the interaction between zonal fields and TAEs.

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Zhixuan Wang
University of California, Irvine

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