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Gyrokinetic Particle Simulation of Alfven Eigenmodes with Zonal Fields ZHIXUAN WANG, ZHIHONG LIN, UCI — 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 Alfven eigenmodes with zonal fields using global gyrokinetic toroidal code GTC. At first, we verified GTC for linear electrostatic simulation in cylindrical geometry with the E x B flow shear. Ion temperature gradient instability is observed to be suppressed when E x B flow shear is strong enough. Recently, we have extended our study into electromagnetic simulation. We benchmarked our simulation result against both gyrokinetic theory and experimental data from LArge Plasma Device. In the next step, we will gradually include nonlinear, toroidal effects to study the interaction between zonal fields and Alfven Eigenmodes in tokamaks. Work supported by DOE SciDAC GSEP Center and Plasma Science Center.

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