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Gyrokinetic Particle Simulations of Energetic Particle Transport by Drift Waves and of Toroidal Alfvén Eigenmodes[1] W. ZHANG, U. Science & Technology of China, W.W. HEIDBRINK, Z. LIN, D.C. PACE, UC-Irvine, D. MCCUNE, PPPL — Simulations with the gyrokinetic toroidal code (GTC) of fast-ion transport by ion-temperature gradient (ITG) turbulence are compared with experimental measurements for a dedicated discharge with excellent fluctuation and fast-ion data. To facilitate the comparison, TRANSP can now utilize fast-ion diffusion coefficients that are arbitrary functions of energy, pitch, and flux coordinate. The strong energy dependence of transport predicted by GTC is in better agreement with the data than a weaker energy dependence. The excitation of shear Alfvén eigenmodes in toroidal systems, such as toroidal Alfvén eigenmode (TAE) and energetic particle mode (EPM), and nonlinear transport by these toroidal shear Alfvén eigenmodes have also been explored through large-scale gyrokinetic simulations using GTC.

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