Contribution ID: **92** Type: **Poster**

TH/P7-03: Gyrokinetic Particle Simulation of Microturbulence in Tokamak Plasmas

Friday, 12 October 2012 08:30 (4 hours)

Recent progress in gyrokinetic simulations of plasma microturbulence using GTC code is reported. Several topics are covered, including anomalous transport of toroidal angular momentum, simulations in real geometry, validation and verification efforts, and extension of the simulation model to include the magnetic field perturbations.
Simulations of momentum transport driven by the ion temperature gradient (ITG) and collisionless trapped electron model (CTEM) turbulence emphasize the important role of particle flux in the momentum convection. Parameter dependence of the momentum pinch is investigated showing strong dependence on the background density gradient.
Comparison of nonlinear simulations using GTC and XGC1 code as well as GTC simulations in realistic geometry of DIII-D and HL-2A tokamaks are presented as a part of validation and verification efforts.
GTC simulations of electromagnetic effects in microturbulence are presented, which include finite-β ITG and kinetic ballooning mode simulation.
Work is supported by US DOE SciDAC GSEP Center

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Session Classification: Poster: P7

Track Classification: THC - Magnetic Confinement Theory and Modelling: Confinement