

Gyrokinetic Turbulence Simulations for Tokamaks and Stellarators: Where Do We Stand?

F. Jenko

Max-Planck-Institut für Plasmaphysik, EURATOM Association, Garching, Germany

Ab initio simulations of microturbulence in magnetized fusion plasmas are based on gyrokinetics. The present state of the art concerning gyrokinetic turbulence simulations will be briefly reviewed, and some outstanding challenges will be discussed. Here, special emphasis will be placed on the scaling of the turbulent transport with key dimensionless quantities like beta and ρ^* , the physics of transport barriers, and the surprisingly strong interaction between fast particles (beam ions, alpha particles, or runaway electrons) and turbulent magnetic field fluctuations.