

Eulerian techniques for gyrokinetics: The GENE code

Frank Jenko,
Max-Planck-Institut für Plasmaphysik

Abstract

Small-scale instabilities and the associated turbulence in fusion plasmas are generally described within the framework of gyrokinetic theory. The latter is an adaptation of the usual Vlasov-Maxwell system to low-frequency phenomena in magnetized plasmas, eliminating a large range of irrelevant spatio-temporal scales. One way to solve this set of nonlinear integro-differential equations is by means of Eulerian methods, similar to those used in Computational Fluid Dynamics. One specific implementation, the GENE code, will be presented, with an emphasis on general numerical challenges and ways to overcome them.