

Gyrokinetic simulation study in precise LHD equilibrium

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In the study on turbulent transport of toroidal plasmas, direct comparison of numerical results of gyrokinetic simulation and experimental data is strongly requested. In this work, in order to understand the mechanism of the turbulent transport more quantitatively, we extended the gyrokinetic Vlasov simulation code, GKV [1], to treat complicated shape of flux surfaces and metric in precise 3D equilibrium obtained by VMEC code [2] which can solve the MHD equilibrium state for given pressure and plasma current profiles in the experiments.

We compare the numerical results of gyrokinetic simulation with the experimental results in the actual equilibrium corresponding experiments in the Large Helical Device (LHD), investigating several properties, e.g. the linear growth rate of the zonal flow.

[1] T.-H. Watanabe and H. Sugama, Nucl. Fusion **46** (2006) 24.

[2] S.P. Hirshman and O. Betancourt, J. Comput. Phys. **96** (1991) 99.