Gyrokinetic simulations of shaping effects on turbulent heat and particle transport observed on the TCV tokamak

X. Lapillonne, T. Dannert, O. Sauter, A. Marinoni, Y. Camenen,
A. Pochelon, L. Villard and S. Brunner

Ecole Polytechnique Fédérale de Lausanne (EPFL)
Centre de Recherches en Physique des Plasmas
Association Euratom-Confédération Suisse
CH-1015 Lausanne, Switzerland

Experimental results from the "Tokamak à Configuration Variable " (TCV) experiment [1, 2] have shown a heat transport coefficient χ_e two times greater with a triangularity $\delta = +0.4$ than in a case with $\delta = -0.4$ in L-mode plasma. These results were the motivation for a systematic study of shaping effects, and especially triangularity, on turbulent transport using the flux-tube gyrokinetic code GENE [3, 4]. In order to enable simulations of realistic tokamak plasma conditions and geometry, the code is extended from the s-alpha approximation to general axisymmetric geometry using an interface with an ideal MHD equilibrium code, CHEASE [5].
In a second stage the code will be used to compare numerical results with experimental data from Electron Internal Transport Barriers (eITBs) studies conducted at TCV in a fully non-inductive discharge. The relative importance of Trapped Electron Modes and Electron Temperature Gradient modes will be investigated. The current status of this work will be presented.

References

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