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

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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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