Gyrokinetic simulations of electrostatic microturbulence in ADITYA-U tokamak

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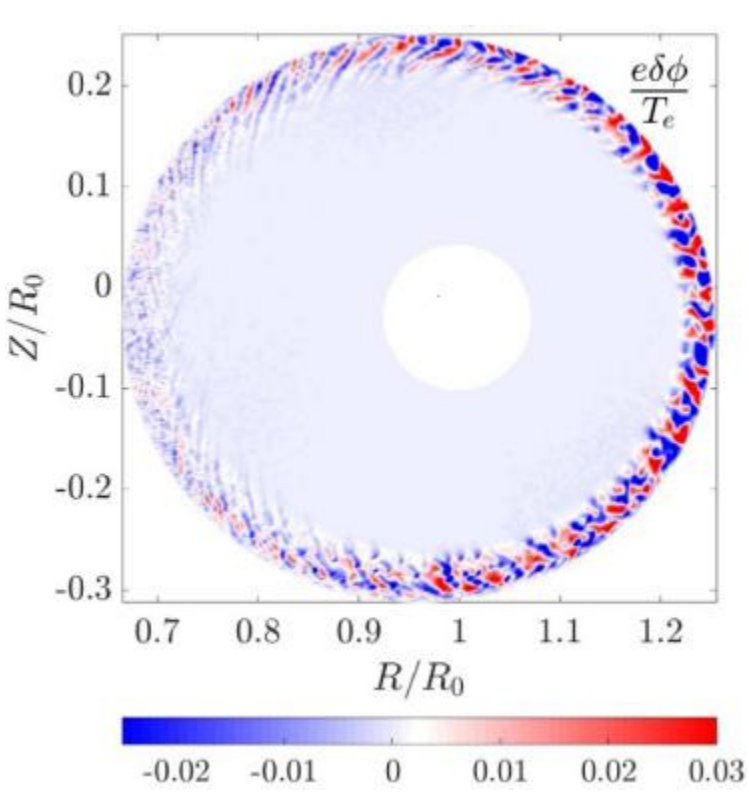

Figure: The electrostatic potential on the poloidal plane of the ADITYA-U tokamak in the nonlinear phase of the simulations.

Turbulent transport due to small scale instabilities remains a major cause of the loss of heat and particle fluxes from the core of a tokamak. Here, the first ever, state-of-the-art, global gyrokinetic simulations are performed in ADITYA-U tokamak using its realistic geometry and experimental profile. Simulations reveal that the trapped electron mode (TEM) driven micro-instability acts as one of the dominant channels for driving the turbulent transport in ADITYA-U. Zonal flow is shown not to play an essential role in regulating the turbulent transport. Collisional effects suppress the turbulence and transport to some extent. Moreover, the global effects play a crucial role in linking the turbulence from edge to the core of the tokamak.

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