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Integrated Edge-core multiscale simulation of Full-f ITG-turbulence in realistic tokamak geometry[1] SEUNG-HOE KU, New York University, Courant Institute Mathematical Sciences, C.S. CHANG[2], KAIST, P.H. DIAMOND, UCSD, CPES TEAM[3] — We report "the-tail-wagging-the-dog" phenomenon observed from the full-f XGC1 simulation of the whole-volume ITG turbulence in realistic tokamak geometry. In H-mode experiments, the core energy confinement is promptly enhanced with steepening of the edge gradient under a strong core heating in diverted magnetic field geometry. The full-f XGC1 simulation studies the dynamical neoclassical and turbulence interaction without scale-separation. It is found that edge turbulence is nonlocally connected to the core through spatial energy propagation, modifying the core turbulence and driving a SOC. Strong core heating and self-organized ExB shear play important roles in this process. Detailed physics mechanisms and experimental implications will be discussed.

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