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Gyrokinetic simulations of microtearing instability[1] RYUSUKE NUMATA, WILLIAM DORLAND, University of Maryland, NUNO LOUREIRO, Instituto Superio Tecnico, BARRETT ROGERS, Dartmouth College, ALEXANDER SCHEKOCHIHIN, Oxford University, TOMOYA TATSUNO, University of Maryland — Microtearing modes driven unstable by electron temperature gradients, may account for the anomaly of electron transport in fusion devices. Since microtearing instabilities are collisional mode ($\nu/\omega_* > 1$; ν and ω_* are the collision and diamagnetic drift frequencies of the electron), these modes should be stable in conventional tokamaks. However, recently, these modes can be the most unstable mode in current spherical tokamaks in which plasma parameters are quite different from conventional tokamaks. We present numerical results of microtearing instability simulations using the `AstroGK` astrophysical gyrokinetics code. We have successfully reproduced the linear growth of the instability predicted by the theory. We also discuss nonlinear saturation, and electron transport induced by this mechanism.

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Ryusuke Numata
University of Maryland

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