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Excitation of Intermediate-Scale Zonal Flow by Electron Temperature Gradient Modes HAOTIAN‘ CHEN, STEFAN TIRKAS, SCOTT PARKER, YANG CHEN, University of Colorado, Boulder — Electron temperature gradient (ETG) mode turbulence is considered as an experimentally relevant mechanism to the electron energy transport in tokamak plasmas. On the basis of nonlinear gyrokinetic equation, the present work analytically addresses the zonal flow generation in ETG turbulence. It is shown that, unlike previous analyses, the intermediate-scale zonal flows can be significantly excited via the modulational instability, and contribute to the regulation of ETG streamers. The threshold of the modulational instability and the associated saturation level are derived. Direct comparisons indicate a qualitative agreement between the theoretical model predictions and recent gyrokinetic simulation results [1,2,3].

References

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Haotian‘ Chen
University of Colorado, Boulder

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