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Maximum-J properties for finite-β collisionless microinstabilities in general geometry

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Max-Planck-Institut für Plasmaphysik

Within the gyrokinetic formalism [1-2], we present the equations for an explicit treatment of the electromagnetic version of the collisionless Universal/Trapped-Electron, and Microtearing modes, in general geometry. The gradient of the plasma , the ratio of kinetic to magnetic pressure, is taken to be small enough to avoid perturbations of the magnetic field strength [3]. We highlight the role of trapped electrons in the resonant destabilization, or damping, via electromagnetic corrections to ideal Ohms's law, for electron-temperature-gradient driven modes whose frequency relates to the bounce-averaged electron curvature drift. We then investigate the stability properties of maximum-J devices [4] (where J is the second adiabatic invariant) at finite , that is, in the regime in which the maximum-J condition is more likely to be satisfied. Nonlinear energetic arguments will also be given.

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Primary author: ZOCCO, alessandro

Co-author: HELANDER, Per (Max Planck Institute for Plasma Physics)

Presenter: ZOCCO, alessandro

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