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Role of magnetic shear and equilibrium flow on stability of collisionless mixed parity and microtearing modes ADITYA KRISHNA SWAMY, DEEPAK VERMA, RAJARAMAN GANESH, Institute for Plasma Research, Gandhinagar, India, STEPHAN BRUNNER, LAURENT VILLARD, SPC, EPFL, 1015 Lausanne, Switzerland — Turbulent transport of energy, particles and momentum is one of the important limiting factors for long time plasma confinement. Modern study using gyrokinetic formalism and simulation has progressed to identify several microinstabilities that cause ion and electron thermal transport. Typically, these have been ballooning parity modes ($\tilde{\varphi}$ is even and $\tilde{A}_{\parallel}$ is odd) such as Ion Temperature Gradient mode (ITG), Kinetic Ballooning Mode (KBM) and Electron Temperature Gradient mode (ETG) which cause transport through fluctuations or tearing parity modes ($\tilde{\varphi}$ is odd and $\tilde{A}_{\parallel}$ is even) such as Microtearing modes (MTM) which change the local magnetic topology and cause transport through stochastization of the magnetic field. Here, the role of global safety factor profile variation on the MTM instability and global mode structure is studied in large aspect ratio tokamaks. Multiple subdominant branches of MTM are linearly unstable in several shear profiles. At lower shear, linearly unstable Mixed Parity Modes are found to exist. The growth rate spectrum, β-scaling in reverse shear profiles and the role of equilibrium flow on the stability and global mode structures of these modes will be presented.

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