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GTC Turbulence Simulations near H-mode Pedestal with Resonant Magnetic Perturbations[1] LEI SHI, Department of Physics and Astronomy, UCI, Irvine CA 92697, NATHANIEL FERRARO, Princeton Plasma Physics Lab, Princeton, NJ 08543, USA, SAM TAIMOURZADEH, Department of Physics and Astronomy, UCI, Irvine CA 92697, JINGYUAN FU, Fusion Simulation Center, Peking University, Beijing, China 100871, ZHIHONG LIN, Department of Physics and Astronomy, UCI, Irvine CA 92697, RAFFI NAZIKIAN, Princeton Plasma Physics Lab, Princeton, NJ 08543, USA — Full plasma responses to Resonant Magnetic Perturbations (RMPs) as provided by the resistive MHD code M3D-C[1] are implemented into Gyrokinetic Toroidal Code (GTC) to study the effect of magnetic islands and stochastic field regions on microturbulence in realistic DIII-D geometry. Electrostatic turbulence simulations with adiabatic electrons show no significant increase of the saturated ion heat conductivity in the presence of RMP-induced islands. However, electron response to zonal flow in the presence of magnetic islands and stochastic fields can drastically increase zonal flow dielectric constant for long wavelength fluctuations. Zonal flow generation can then be reduced and the microturbulence can be enhanced greatly. Furthermore, because the RMP magnetic island size is comparable to the ion banana width, electron and ion responses to these islands may be fundamentally different, which could drive non-ambipolar particles fluxes leading to changes of the radial electric field shear.

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