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Gyrokinetic Studies of Microtearing Modes in the Reversed Field Pinch DANIEL CARMODY, University of Wisconsin - Madison, VARUN TANGRI, University of New Hampshire, P.W. TERRY, University of Wisconsin - Madison —
Linear gyrokinetic simulations are performed using the GYRO code modified for RFP equilibria. It is shown that a transition occurs between ITG at low electron β to microtearing modes as β_e increases. Initially the two modes occur at the same length scales, but as β_e increases there is a shift of the microtearing modes to smaller scales. The critical β_e value for the switchover between the two modes is approximately 4.5%, a characteristic value for standard discharges of the Madison Symmetric Torus, indicating that both ITG and microtearing may be important for these runs, while PPCD discharges are more likely to be exclusively in the microtearing dominant regime. We investigate the dependence of the microtearing modes on a variety of parameters including electron temperature gradient, temperature ratio, and collisionality. We find the critical temperature gradient for instability to be $a/L_{te} \sim 3$. We also find evidence for a collisionless microtearing regime, possibly associated with negative shear, and we compare these results with theoretical predictions.

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