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The scaling of micro-turbulence in Reversed Field Pinch Plasmas¹ VARUN TANGRI, DANIEL CARMODY, PAUL TERRY, Univ. of Wisconsin, Madison, RONALD WALTZ, General Atomics, San Diego — Previous investigations on Reversed Field Pinch (RFP) plasmas have not convincingly explained observations of turbulence driven transport in improved confinement discharges, where tearing mode activity is suppressed through current profile control. The scaling of transport and linear growth rate with gradient scale-lengths, plasma β , shear, normalized ion sound gyro-radius $\rho_* = \rho_s/a$, radial profile and other parameters may help differentiate between various plausible theories for small scale turbulence. In this work, we examine the Ion Temperature Gradient (ITG) mode, the Trapped Electron mode (TEM), Kinetic Ballooning mode (KBM) and others using the gyrokinetic code GYRO in a collisionless limit with a real RFP geometry. We investigate the critical β for the ITG to KBM and TEM transitions (which are well known for tokamaks), for Madison symmetric torus (MST) parameters. Linear and nonlinear characteristics of gyrokinetic simulations such as saturation level, mean wave-number $\langle k \rangle$ have been investigated for possible correlations with experiment.

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