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The role of Nonlinear Ion Temperature Gradient Driven Drift Modes in a Reversed Field Pinch Plasma VARUN TANGRI, PAUL TERRY, University of Wisconsin-Madison, R.E. WALTZ, General Atomics, San Diego, California 92186, USA — The Ion Temperature gradient (ITG) mode has been rarely investigated in Reversed Field pinch (RFP) plasmas, although its role tokamak turbulence has been studied extensively. In this work, we investigate if it is plausible that ITG may play a role in particle and heat confinement in such devices. The linear stability and nonlinear saturation of ITG is investigated in the RFP geometry by modifying the gyrokinetic code GYRO[1] in a low beta, collisionless limit with and without non-adiabatic electrons. A simple toroidal equilibrium has been devised that is specified by just two parameters: the pinch parameter and the radial position. The level of transport is shown to be sensitive to temperature and density gradients and the threshold is found. To determine the nature of the instability, we study parametric scaling and also compare results with the well-known CYCLONE base case for tokamak simulations. We also estimate mixing level transport for MST parameters using linear simulations to determine if the instability is relevant to the small-scale turbulence observed in MST.

[1]J. Candy and R.E. Waltz, J. Comp. Phys. 186, 545 (2003).

Varun Tangri
University of Wisconsin-Madison

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