

Abstract Submitted
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The effects of 3-D shaping on ITG stability¹ MORDECHAI RORVIG, CHRIS HEGNA, University of Wisconsin — In this work we seek to understand how 3-D shaping can be used to improve ion temperature gradient stability. Part of the difficulty in deducing the role of 3-D shaping is the generation of 3-D MHD equilibria necessary for the calculations. In this work, MHD equilibrium surfaces are generated using local 3-D magnetostatic equilibrium theory [1]. We distinguish three different types of toroidal magnetic surface shaping: axisymmetric shaping, toroidal rotation of the cross section, and toroidal translation of the magnetic axis. We study these types of shaping independently and in combination to look for improvements. Linear growth rates for ITG modes are calculated using the gyrokinetics code GENE [2]. The geometric interface package GIST [3] accepts the equilibrium input data from the local equilibrium calculation. Growth rates for both axisymmetric and 3-D equilibrium calculations are presented.

[1] C. C. Hegna, *Physics of Plasmas* **7**, 3921 (2000).

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[3] P. Xanthopoulos, W. A. Cooper, F. Jenko, Yu. Turkin, A. Runov, and J. Geiger, *Physics of Plasmas* **16**, 082303 (2009).

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