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Simulation of drift wave instability in field-reversed configurations using global magnetic geometry D. P. FULTON, Tri Alpha Energy, C. K. LAU, Z. LIN, University of California, Irvine, T. TAJIMA, Tri Alpha Energy, I. HOLOD, University of California, Irvine, THE TAE TEAM — Minimizing transport in the field-reversed configuration (FRC) is essential to enable FRC-based fusion reactors. Recently, significant progress on advanced beam-driven FRCs in C-2 and C-2U (at Tri Alpha Energy) provides opportunities to study transport properties using Doppler backscattering (DBS) measurements of turbulent fluctuations and kinetic particle-in-cell simulations of driftwaves in realistic equilibria via the Gyrokinetic Toroidal Code (GTC) [1,2]. Both measurements and simulations indicate relatively small fluctuations in the scrape-off layer (SOL). In the FRC core, local, single flux surface simulations reveal strong stabilization, while experiments indicate quiescent but finite fluctuations. One possible explanation is that turbulence may originate in the SOL and propagate at very low levels across the separatrix into the core. To test this hypothesis, a significant effort has been made to develop A New Code (ANC) based on GTC physics formulations, but using cylindrical coordinates which span the magnetic separatrix, including both core and SOL. Here, we present first results from global ANC simulations. [1]D. P. Fulton et al, Phys. Plasmas 23, 012509 (2016). [2]D. P. Fulton et al, Phys. Plasmas 23, 056111 (2016).

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