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Cross-separatrix Coupling in Nonlinear Global Electrostatic Turbulent Transport in C-2U[1] CALVIN LAU, Univ of California - Irvine, DANIEL FULTON, Tri Alpha Energy, Inc., JIAN BAO, ZHIHONG LIN, Univ of California - Irvine, MICHL BINDERBAUER, Tri Alpha Energy, Inc., TOSHIKI TAJIMA, Univ of California - Irvine; Tri Alpha Energy, Inc., LOTHAR SCHMITZ, Univ of California - Los Angeles, THE TAE TEAM — In recent years, the progress of the C-2/C-2U advanced beam-driven field-reversed configuration (FRC) experiments at Tri Alpha Energy, Inc. has pushed FRCs to transport limited regimes. Understanding particle and energy transport is a vital step towards an FRC reactor, and two particle-in-cell microturbulence codes, the Gyrokinetic Toroidal Code (GTC) and A New Code (ANC), are being developed and applied toward this goal. Previous local electrostatic GTC simulations find the core to be robustly stable with drift-wave instability only in the scrape-off layer (SOL) region. However, experimental measurements showed fluctuations in both regions; one possibility is that fluctuations in the core originate from the SOL, suggesting the need for non-local simulations with cross-separatrix coupling. Current global ANC simulations with gyrokinetic ions and adiabatic electrons find that non-local effects (1) modify linear growth-rates and frequencies of instabilities and (2) allow instability to move from the unstable SOL to the linearly stable core. Nonlinear spreading is also seen prior to mode saturation. We also report on the progress of the first turbulence simulations in the SOL.

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