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Numerical Model Developments for Turbulent Transport in C-2W CALVIN LAU, TAE Technologies, Inc., ZHIHONG LIN, University of California, Irvine, TOSHIKI TAJIMA, SEAN DETTRICK, TAE Technologies, Inc., LOTHAR SCHMITZ, University of California, Los Angeles, TAE TEAM — In TAE Technologies' current experimental device, C-2W (also called "Norman"), record breaking, advanced beam-driven field reversed configuration (FRC) plasmas are produced and sustained in steady state utilizing variable energy neutral beams, advanced divertors, end bias electrodes, and an active plasma control system. In a prior experiment, C-2U, Doppler Backscattering (DBS) measurements of the advanced beam-driven FRC plasmas exhibited distinct qualities in the density fluctuations when comparing the core and scrape-off layer (SOL) regions: core fluctuations are consistently low in amplitude while SOL fluctuations have large amplitude at ion-scales and decrease towards electron-scales. Gyrokinetic simulations using the cross-separatrix particle-in-cell ANC code show that such fluctuation spectra arise from the interaction of the quiescent core and less stable SOL: unstable modes grow in the SOL; these fluctuations can then spread across the separatrix into the core. Two important features, present in C-2W, were neglected by previous simulations: low magnetic field regions, where particles with large orbits may cross, and electrode biasing at axial ends, which can introduce shear. Recently, a fully kinetic "drift-Lorentz" particle mover, valid throughout the FRC, has been implemented. A Dirichlet boundary has also been added for end biasing. The numerical developments will be discussed, and preliminary results of microturbulence simulations will be presented.

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