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**Comparison of Collisional Drift-Wave Simulation with CSDX Experimental Results** PAYAM VAEZI, CHRISTOPHER HOLLAND, GEORGE TYNAN, SAIKAT THAKUR, CHRISTIAN BRANDT, UC San Diego, BENJAMIN DUDSON, York University, BRETT FRIEDMAN, TROY CARTER, UC Los Angeles — Recent upgrades to the linear Controlled Shear Decorrelation Experiment (CSDX) [Burin et al, PoP 2005] at UCSD (maximum Bz from 1kG to 2.4 kG, increase of helicon source diameter from 10 cm to 15 cm) have revealed a rich array of turbulence dynamics at previously inaccessible conditions. We report initial comparisons of linear and nonlinear collisional drift-wave physics made using analytic theory and the BOUT++ code [Dudson et al, CPC 2009] against these observations, focusing upon the transition from nonlinearly coupled but distinct eigenmodes at 0.9 kG to fully developed broadband turbulence at 2.4 kG. Comparisons of predicted linear eigenmode structures, frequencies, and density-potential cross-phases to measurement are presented, as well as predictions for nonlinear frequency power spectra and saturated fluctuation levels. We also report progress on the development and implementation of synthetic Langmuir probe and fast framing camera diagnostics for improving the fidelity of our model-experiment comparisons.

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