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[ ] Theory [x] Experiment

Comparison of Neoclassically Predicted Poloidal Rotation with Experimental Measurements,* W.M. Solomon, G.J. Kramer, R. Nazikian, *PPPL*; K.H. Burrell, P. Gohil, R.J. Groebner, *GA*; L.R. Baylor, *ORNL*; T.L. Rhodes, *UCLA*; G.R. McKee, *U Wisc*.– We present a test of the neoclassical theory of rotation against experimental measurements. In particular, measured poloidal rotation profiles from the charge exchange recombination (CER) spectroscopy system on DIII-D are compared with predictions from the code NCLASS. A specialized set of viewing chords has been utilized to properly account for various atomic physics effects that contribute significantly to the measured, uncorrected velocities. In quiescent H-mode discharges, the experimentally measured profiles differ from neoclassical by more than an order of magnitude. Such a large discrepancy has a considerable effect on the inferred radial electric field, as determined through the radial force balance. To help confirm the magnitude of the poloidal velocity, fluctuation diagnostic techniques including correlation reflectometry and beam emission spectroscopy are used to measure the poloidal propagation velocity of the turbulence. This subsequently provides an indirect measure of the radial electric field, under the assumption that the turbulence propagates poloidally at the E×B velocity.

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