Abstract Submitted for the DPP05 Meeting of The American Physical Society

A Neoclassical Calculation of Toroidal Rotation Profiles in DIII-D R.W. JOHNSON, W.M. STACEY, J. MANDREKAS, Georgia Tech. — A calculation model based on neoclassical viscosity and on momentum and particle balance was found to predict global momentum confinement times in DIII-D [1,2] and other tokamaks [3]. An extended model [4,5] has now been applied to calculate the radial distribution of toroidal rotation in several DIII-D shots in a variety of energy confinement regimes (L and H mode, ITB, QDB). Calculated toroidal rotation velocities were generally found to over-predict central experimental values by a factor of 1.5 to 5, reducing to a factor of 1.2 to 2 at  $\rho \approx 0.8$ -0.9. Calculations are in progress to determine what part of this over-prediction is due to outward momentum convection and what part should be attributed to anomalous transport. The observed improvement in confinement of L-mode and ITB discharges with neon injection was predicted.

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