Limit Cycle Oscillations and L/H Transitions From Mean Field Momentum Transport Equations[1] G.M. STAEBLER, R.J. GROEBNER, GA — The momentum transport of the mean field ExB toroidal and ion parallel velocities are modeled with both collisional and turbulent contributions to the transport equations. It will be shown that there are normal one-step L/H transitions to suppressed turbulence and newly discovered limit cycle oscillations (LCO), from this two dimensional system. The suppression of tubulence by ExB velocity shear provides the drive for both types of transitions converting fluctuation intensity into parallel and ExB flow. The results of the new model will be compared with recent high-resolution measurements. The frequency of the LCO and the L/H transition timescale can be matched by the model. The phase shift between the density fluctuation amplitude of the turbulence and the ExB velocity shear is shown to depend on the evolution of the linear growth rate of the turbulence. The density dependence of the H-mode power threshold is consistent with the model with a strong increase in the H-mode threshold at low density.

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