Gyrokinetic Theory and Simulation of Angular Momentum Transport\textsuperscript{1} R.E. WALTZ, G.M. STAEBLER, J. CANDY, F.L. HINTON, General Atomics — A gyrokinetic theory of turbulent toroidal angular momentum transport as well as modifications to neoclassical poloidal rotation from turbulence is formulated starting from the fundamental six-dimensional kinetic equation. GyroBohm-scaled transport is evaluated from toroidal gyrokinetic simulations using the GYRO code \cite{1}. The simulations quantify the two pinch mechanisms in the radial transport of toroidal angular momentum: the slab geometry ExB shear pinch \cite{2} and the toroidal geometry “coriolis” pinch due to finite parallel velocity \cite{3}. The pinches allow the steady-state null stress (momentum transport) condition required for intrinsic toroidal rotation in heated tokamaks without an internal source of torque \cite{4}. A predicted turbulent shift in the neoclassical poloidal rotation \cite{5} may be significant.

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