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GYRO simulations of turbulently driven 'intrinsic rotation' in C-mod plasmas[1] D.R. MIKKELSEN, M. BITTER, K.W. HILL, Princeton University, Y. PODPALY, J.E. RICE, J.W. HUGHES, Y. MA, MIT, J. CANDY, R.E. WALTZ, General Atomics — In some C-Mod plasmas with no externally applied torque, the radial profile of the toroidal rotation speed indicates that "intrinsic rotation" is generated in the plasma core. GYRO simulations of L-Mode and I-mode plasmas are used to learn if the turbulent transport of toroidal angular momentum might cause intrinsic rotation by removing angular momentum, thereby spinning up the plasma in the opposite direction. Two of the three plasmas have strong radial gradients in the measured toroidal rotation; the third is a "control" case. In GYRO simulations there is an inward flow of momentum when the input has no radial gradient of the toroidal rotation speed. We estimate the gradient that GYRO 'predicts' by varying the input gradient until we bracket the target state of zero momentum flux. The sign of the rotation speed gradient predicted by GYRO agrees with experiment, and the magnitude is generally within a factor of two - GYRO tending to be lower, but not everywhere. For the "control" case GYRO predicts an intrinsic rotation gradient a factor of 3-5 smaller than for the other cases.

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