Abstract Submitted
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Modeling of Toroidal Rotation in Low Torque DIII-D Discharges with TGLF+NEO[1] G.M. STAEBLER, J.E. KINSEY, R.E. WALTZ, E.A. BELLI, General Atomics — Momentum transport due to gyrokinetic turbulence is now included in the Trapped Gyro-Landau Fluid (TGLF) quasi-linear transport model. The TGLF model includes the following causes of momentum transport: Parallel velocity shear, parallel velocity, $E \times B$ Doppler shift shear, up/down asymmetry of flux surfaces, and diamagnetic velocity shear. For discharges with significant unbalanced neutral beam torque the diamagnetic level flows can be neglected compared to the $E \times B$ toroidal velocity. The predicted toroidal rotation in these cases agrees well with data for the limited survey completed so far. For low-torque balance NBI injection cases, the $E \times B$ velocity is of the same size as the diamagnetic velocity. Even for zero external torque, there can be a toroidal rotation generated by the Reynolds stresses due to all of the contributions other than the parallel velocity shear. Results for a low-torque DIII-D discharge will be presented using TGLF combined with neoclassical transport and poloidal flows computed using the high-accuracy NEO code. Density, temperature, and rotation are predicted.

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