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Relaxation to neoclassical flow equilibrium in gyrofluid simulations BRUCE SCOTT, Max-Planck-IPP, Garching, Germany — The theorem for toroidal angular momentum conservation within gyrokinetic field theory is used as a starting point for consideration of slow transport of flows under quasistatic force balance. If conserved/transported quantities are taken as given, the radial electric field is solved in terms of the neoclassical poloidal flow of each species and the total toroidal angular momentum. Standard result is recovered if the latter is small. In a gyro-kinetic or -fluid computation the collisional operator determines the parallel flow, which together with the momentum determines the radial electric field. Higher order drift terms included in the original Lagrangian yield contributions to these relations which can be measured by gyrokinetic computations. We find that for gyrofluid computations under conventional tokamak conditions that these are small. Finally, the pathway of relaxation to slowly varying conditions from an arbitrary initial state is detailed. The time scale hierarchy is separated to have Alfven and then geodesic oscillations damp away, and then on the ion collisional time scale the electric field is established, and then on the much slower confinement time the conserved quantities are transported. We detail these in a simple model and in gyroflluid computations.

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