

Abstract Submitted
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Radial transport in tokamaks in the gyrokinetic ordering¹ FELIX I. PARRA, PETER J. CATTO, Plasma Science and Fusion Center, MIT, Cambridge, MA — We analyze the transport of particles, energy and momentum in the gyrokinetic formalism, retaining both the turbulent shorter wavelengths and the collisional longer length scales (on the order of the minor radius of the tokamak). In particular, we compare the radial transport obtained by using moments of the full Fokker-Planck equation and the radial transport calculated from moments of a gyrokinetic equation correct to first order in ion Larmor radius over minor radius. This comparison is especially interesting because several full f codes are being built that assume that the first order gyrokinetic equation is enough to evolve the full distribution function (and thereby evolve radial profiles). We expect that our analysis will provide insight into whether the missing second order terms in the gyrokinetic equation are important for the evolution of the long wavelength, Maxwellian piece of the distribution function. In addition, our analysis will include momentum transport, needed to determine the long wavelength axisymmetric radial electric field and the toroidal velocity shear.

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