Abstract Submitted
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Intrinsic rotation driven by neoclassical departure from a Maxwellian[1] PETER J. CATTO, MICHAEL BARNES, FELIX I. PARRA, Plasma Science and Fusion Center, MIT, Cambridge, MA — Intrinsic rotation is the rotation observed in tokamak plasmas in the absence of momentum injection. Turbulence redistributes toroidal angular momentum within the core leading to differentially rotating plasmas that may have better stability and transport properties. To self-consistently calculate the momentum transport that leads to observed intrinsic rotation profiles, it is necessary to account for all the mechanisms that provide a preferred direction for the plasma rotation. A fundamental symmetry of the fluctuations shows that to lowest order in an expansion in the ratio of the gyroradius over scale length, turbulent momentum transport cannot give rise to intrinsic rotation, and higher order effects must be considered. This feature is an added difficulty, because it implies going to higher order, but also an advantage since it helps identify which mechanisms will lead to intrinsic rotation. In this poster, we consider for the first time the effect of the neoclassical departures from a Maxwellian on the turbulence, showing that it is an appreciable contribution to intrinsic rotation. We will study how this intrinsic rotation drive changes with temperature gradient and collisionality.

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