

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

The Residual Zonal Flow in Toroidally Rotating Tokamak Plasmas DENG ZHOU, Institute of Plasma Physics, Chinese Academy of Sciences — The residual zonal flow, initially driven by ion-temperature-gradient turbulence, is considered for a toroidally rotating tokamak plasma. The gyro-kinetic equation is solved for two limiting cases: low speed toroidal rotation and sonic speed rotation. The general expression of the residual zonal flow for the two cases is the same as that of the static plasma but the numerical result is different due to the different evaluation of particle orbit average and the non-uniformity of density on magnetic surfaces. The level of the residual zonal flow decreases as the rotation velocity increases. For rotation at sonic speed the value of residual zonal flows is approximately one third of static cases. The presented result may be important in the fluid simulation of turbulence for rotating tokamak plasmas.

Deng Zhou
Institute of Plasma Physics, Chinese Academy of Sciences

Date submitted: 08 Jul 2013

Electronic form version 1.4