

Abstract Submitted  
for the DPP17 Meeting of  
The American Physical Society

**Effects of Toroidal Rotation on Neoclassical Toroidal Viscosity Torque in Tokamak Edge Pedestal Induced by Resonant Magnetic Perturbation**<sup>1</sup> XINGTING YAN, University of Science and Technology of China, PING ZHU, University of Science and Technology of China, University of Wisconsin-Madison — Previous analysis for static tokamak equilibria indicates that the neoclassical toroidal viscosity (NTV) torque in edge pedestal region induced by external resonant magnetic perturbation (RMP) can reach the same order of magnitude as other momentum sources such as neutral beam injections [1]. However, toroidal rotation often persists in tokamak experiments, especially in the edge pedestal region. How the edge rotations may affect the NTV torque remains an open question. In this work, we evaluate the influence of toroidal rotation on NTV torque in the edge pedestal region, using the method developed in previous work [1]. We find that toroidal rotation can modify not only the magnitude, but more importantly, also the profile of NTV torque significantly. Even for a rigid toroidal rotation, as its magnitude increases, the peak value of NTV torque decreases, whereas its peak location moves towards the core region. The detailed comparisons of NTV torque for different toroidal rotation magnitudes and profiles, in terms of its significance in the edge pedestal region, will be reported and discussed. [1] X.-T. Yan, P. Zhu, and Y.-W. Sun, submitted to Phys. Plasmas (2017).

<sup>1</sup>Supported by the National Magnetic Confinement Fusion Science Program of China under grant Nos. 2014GB124002 and 2015GB101004, and the 100 Talent Program of the Chinese Academy of Sciences.

Ping Zhu  
University of Science and Technology of China

Date submitted: 14 Jul 2017

Electronic form version 1.4