

Abstract Submitted  
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**Neoclassical toroidal plasma viscosity in the vicinity of the magnetic axis in tokamaks** K.C. SHAINING, Plasma and Space Science Center, National Cheng Kung University and University of Wisconsin, Y. SUN, Forschungszentrum Julich, Association EURATOM-FZJ, S.A. SABBAGH, Columbia University, M.S. CHU, General Atomics — Error fields in tokamaks do not vanish on the magnetic axis. Thus, neoclassical toroidal plasma viscosity does not vanish on the axis either. Here, the theory for neoclassical toroidal plasma viscosity is extended to the region near the magnetic axis. Two isomorphic models are presented to investigate the neoclassical toroidal plasma viscosity in that region. The analytic expressions for the viscosity in the low collisionality regimes are calculated. The results can be compared to the experimentally measured toroidal flow damping rate in the near magnetic axis region. The isomorphic transformation developed here can also be used to transform all the analytic expressions of the neoclassical toroidal plasma viscosity calculated for tokamaks to any toroidal system with arbitrary equilibrium symmetry property.

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