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[ ] Theory [ ] Experiment [ X ] Combined/General

**Testing the Validity of the Neoclassical Toroidal Viscosity Model of Torque due to 3D Non-Resonant Magnetic Fields,*** A.J. McCubbin, *Hope College*; S.P. Smith, N.M. Ferraro, *General Atomics*; J.D. Callen, *U. Wisconsin*; O. Meneghini, *ORISE* – Understanding the torque applied by resonant and non-resonant magnetic perturbations and its effect on rotation is essential to predict confinement and stability in burning plasmas. Non-axisymmetric 3D fields produced in the DIII-D tokamak apply a torque to the plasma, which can be evaluated through its effect on the plasma rotation. One explanation for this torque is Neoclassical Toroidal Viscosity (NTV) acting through non-resonant field components [1]. We have developed a software framework in which magnetic perturbations calculated by the state of the art two fluid MHD code M3D-C1 can be used in NTV calculations. For discharges with applied external magnetic fields in DIII-D, the experimentally determined torques will be analyzed and compared with NTV models.

[1] J.D. Callen, Nucl. Fusion **51**, 094026 (2011).

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