Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Neoclassical Rotation Theory for Toroidal and Poloidal Rotation Velocities Using Miller Equilibrium Analytical Flux Surface Geometry[1]
C. BAE, W.M. STACEY, Georgia Tech. — Rotation of tokamak plasmas is not only of intrinsic interest for understanding transport but also is important for the stabilization of tokamak plasmas and other reasons. The neoclassical viscosity depends on the poloidal dependence of various quantities, which in turn depend on the poloidal dependence of the magnetic geometry, among other things. The objective of this research is to derive the neoclassical toroidal and poloidal rotation theory for tokamaks using the more accurate representation of the equilibrium flux surface geometry given by "Miller equilibrium flux surface model". The Miller model improves earlier flux surface models by taking into account the shifted centers $R_0(r)$ of the flux surfaces (Shafranov shift), the elongation κ, and triangularity δ, thus more accurately describing the actual flux surfaces in tokamak plasmas.

[1]Work supported by the US Department of Energy under DE-FG02-00ER54538 and DE-FC02-04ER54698.

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Date submitted: 17 Jul 2010 Electronic form version 1.4