Abstract Submitted
for the DPP01 Meeting of
The American Physical Society

Sorting Category: 5.6.2 (Theory/Computational)

Heating Induced Toroidal Rotation and Other Consequences of Anomalous Momentum Transport in Tokamaks[1]
G.M. STAEBLER, R.E. WALTZ, General Atomics, J.E. KINSEY, Lehigh U. — Viscous stress due to driftwave turbulence plays an important role in determining the electric field in a tokamak plasma. Interaction of the neoclassical viscous stress, which damps poloidal rotation, and the anomalous contributions due to driftwaves leads to some surprising phenomena. A derivation and discussion of the momentum transport equations will be given. The GLF23 transport model is used to compute the fluxes and stresses due to driftwaves. Three examples of numerical solutions to the full set of transport equations will be given. The first example illustrates the toroidal rotation generated in heated plasmas even without external torques. The numerical solutions are compared to the qualitative features observed in the Alcator C-Mod tokamak. The second example is the viscous shear layer at the last closed flux surface (separatrix or limiter). The sensitivity of the L/H power threshold to the open field line poloidal flow is demonstrated. The third example is the poloidal spin-up precursor to an internal transport barrier. This was observed on TFTR with balanced neutral beam heating.

[1]Work supported by the US DOE under Grant Nos. DE-FG03-95ER54309 and DE-FG02-92ER54141.

G.M. Staebler
staebler@fusion.gat.com
General Atomics

☐ Prefer Oral Session
☒ Prefer Poster Session

Special instructions: Poster 14, Transport, Boundary Plasma

Date submitted: July 20, 2001 Electronic form version 1.4