Abstract Submitted
for the DPP09 Meeting of
The American Physical Society

Toroidal Rotation With Near-Balanced NBI in DIII-D H-Mode Discharges[1] J.S. DEGRASSIE, K.H. BURRELL, R.J. GROEBNER, General Atomics, W.M. SOLOMON, PPPL — Intrinsic rotation exists in the tokamak with no applied auxiliary torque and is important to understand for projection to burning plasmas and ITER. Rice's scaling, that $V \sim W/I_p$ [1], exists in other tokamaks, including DIII-D, where V is toroidal velocity, and W the stored energy. A dimensionless casting of this scaling is being sought [1]. Heating by rf waves is the primary tool to investigate intrinsic rotation in H-mode conditions. It is difficult to attain ITER-relevant values of $\beta_N \sim 2$ simply due to the typical rf power capabilities installed, compared with neutral beam injection (NBI). In DIII-D we are using the balanced beam capability to investigate the intrinsic rotation scaling at these β_N values. An issue is the localized remnant torque density that exists to some extent with mirrored beam injection, because of the opposite radial drift of co- and counter-injected fast ions. We will show how these higher β_N conditions compare with the Rice scaling and account for remnant torque.

[1] J.E. Rice, Nucl. Fusion **47**, 1618 (2007).

[1]Work supported by the US DOE under DE-FC02-04ER54698 and DE-AC02-09CH11466.

J.S. deGrassie
General Atomics

Date submitted: 22 Jul 2009 Electronic form version 1.4