Abstract Submitted
for the DPP14 Meeting of
The American Physical Society

Measurements of the Structure of the Plasma Rotation in Slowly Rotating Tearing Modes in DIII-D[1] N.Z. TAYLOR, Oak Ridge Associated Universities, N.M. FERRARO, R.J. LA HAYE, C.C. PETTY, General Atomics, C. BOWMAN, University of York — A helically modified ion flow by an island can lead to helical ion polarization currents which can affect tearing mode stability. This issue is of particular importance to ITER where large inertia and relatively low torque will likely result in low rotation. In DIII-D cases either (1) a m/n=2/1 mode is slowed down to ∼1 kHz (faster than the inverse wall time) by near balanced neutral beams or (2) an island is entrained by applied rotating n=1 magnetic field at 10 Hz (slower than the inverse wall time). The n=1 island structure is measured with electron cyclotron emission radiometry. The ion rotation and temperature are measured by fast resolution (274 μs) charge exchange recombination (CER) spectroscopy in the 1 kHz freely rotating case and by standard CER (5 ms) in the 10 Hz entrainment. Tangential and vertical CER arrays allow for the radial profile of the helically perturbed rotation to be determined. A comparison of the measured nonlinear island structures with that from the linear resistive stability code M3D-C1 will be presented.

[1]Work supported in part by the US Department of Energy under DE-FG02-95ER54309 and DE-FC02-04ER54698.

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Date submitted: 11 Jul 2014 Electronic form version 1.4