Abstract Submitted
for the DPP17 Meeting of
The American Physical Society

Thermal and Particle Transport in Strong Interchange-Type Turbulence . KENNETH GENTLE, WILLIAM ROWAN, University of Texas at Austin, MARK KOEPKE, SAM NOGAMI, West Virginia University — The Helimak is an approximation to the infinite cylindrical slab with a size large compared with turbulence transverse scale lengths, but with open field lines of finite length. A pressure gradient in unfavorable magnetic curvature is unstable to interchange-type modes, leading to large amplitude nonlinear fluctuations similar to those in a tokamak SOL. A novel magnetically-baffled probe cluster permits full characterization of the turbulence, including particle and thermal radial transport rates across the plasma profile. Transport rates vary with plasma parameters, but they can be most strongly modified by the application of bias to alter the transverse (poloidal, orthogonal to B and R) flow patterns. The transport effects are mediated by two, often independent, mechanisms. First, the bias changes the amplitudes of the fluctuating fields responsible for the transport. Second, the bias changes the coherence between the fields (seen in either time or frequency domains), leading to changed net transport. Work supported by the Department of Energy OFES DE-FG02-04ER54766.

Kenneth Gentle
University of Texas at Austin

Date submitted: 14 Jul 2017 Electronic form version 1.4