Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Modelling of turbulence driven momentum tranport[1] F. KERIM, O.D. GURCAN, P.H. DIAMOND, CASS-University of California, San Diego, T.S. HAHM, PPPL — We suggest a simple model of turbulence driven transport of parallel momentum. The model incorporates the commonly invoked effects of diffusion, so-called momentum "pinch" term (i.e. a supposedly inward advection of mean momentum) and an additional off-diagonal term driven by and proportional to the radial $\mathbf{E} \times \mathbf{B}$ shear. It is observed that in a cylinder the a part of this "pinch" term comes from the fact that particles can carry momentum, and that there is a pinch in particle transport. On the other hand, the off-diagonal term comes purely from the Reynolds stress between the parallel momentum fluctuations and the perpendicular $\mathbf{E} \times \mathbf{B}$ fluctuations, and it requires symmetry breaking. The form of the model presented here is based on the assumption that the dominant mechanism for symmetry breaking in the core of a periodic cylinder is a shift of the eigenmode from the rational surface induced by the radially sheared poloidal $\mathbf{E} \times \mathbf{B}$ flow.

[1]This research was supported by U.S.Department of Energy Grant No. FG02-04ER 54738 and U.S. DOE Contract No. DE-AC02-76-CHO-3073.

O. D. Gurcan
CASS-University of California, San Diego

Date submitted: 21 Jul 2006 Electronic form version 1.4