

Project Description APPH 4990:

I propose to do a survey of toroidal drift type of instabilities that can be observed in large scale tokamaks like the ITER. The survey will include an investigation of electron and ion temperature gradient instabilities in toroidal geometry and will focus on the following points:

- conditions for stability
- estimation and kinetic calculation of growth rates.
- the effects of magnetic curvature, EXB stabilization and magnetic shear induced damping/localization of the modes
- the possible contribution of these modes to turbulent transport and thermal conductivity.

The papers reviewed as a part of this project will include review letters as of the drift wave phenomena as well as simulation papers carried in toroidal geometry applicable to ITER.

References:

- Z.Lin et al, Journal of Physics: Conference Series 180 (2009) 012059
- W.Horton, Reviews of Modern Physics, Vol. 71, No. 3, April 1999
- G.L. Falchetto et al, Plasma Phys. Control. Fusion 50 (2008) 124015 (12pp)

Note: The reference papers are likely to be extended.