Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

A New Formulation of the Quasi-linear Transport Theory for the Trapped Gyro Landau Fluid Model[1] G.M. STAEBLER, J.E. KINSEY, R.E. WALTZ, General Atomics — A quasi-linear model of turbulence evaluates the bilinear fluctuation driven fluxes using linearly unstable eigenmodes. A model for the saturated amplitude of the turbulence is used to complete the flux calculation. It is traditional to normalized the fluxes by the amplitude of the electrostatic potential (phi-norm) induced by the linear eigenmode. This is the formulation used in the GLF23 model and in the recently published Trapped Gyro-Landau Fluid (TGLF) model [1]. The normalization of the fluxes is not unique. A variety of alternate choices for normalization have been tested with a large database (>150 runs) of non-linear gyrokinetic simulations using the GYRO code. It was found that several alternate choices give much better fits to this database than the phi-norm for simple mixing length saturation formulas. Using the modulus of the whole linear eigenvector for the TGLF equations as the norm (v-norm) gives a nearly optimum fit to GYRO. This v-norm version of the model fits both s-alpha and shaped Miller geometries
[1] G.M. Staebler, *et al.,* Phys. Plasma **14**, 055909 (2007).

[1]Supported by the US DOE under DE-FG03-95ER54309.

G.M. Staebler
General Atomics

Date submitted: 22 Jul 2007 Electronic form version 1.4