

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Flux tube train model for toroidal plasma turbulence simulations¹

T.-H. WATANABE, H. SUGAMA, A. ISHIZAWA, M. NUNAMI, National Institute for Fusion Science — A flux tube model widely used in gyrokinetic and gyrofluid simulations of toroidal plasma turbulence, where the field line coordinates are applied to a local simulation box placed on a flux surface, is useful for accurately describing the ballooning type mode structure of drift waves. However, if the unstable mode structure widely expands in the poloidal angle, some numerical difficulties arise. While a remedy is to extend the poloidal length of the simulation box, it leads to a severe CFL condition. To overcome the numerical limitation, a “flux tube train” model is developed, where a series of flux tubes are connected along the field line. The new simulation model is successfully applied to the ion temperature gradient turbulence even in cases with poloidal correlation lengths longer than 2π , and is verified by detailed comparisons with the conventional flux tube results.

¹This work is supported in part by grants-in-aid (No. 24561030), by NIFS Plasma Simulator Project, and by IFERC-CSC Project (GTNAXIS).

T.-H. Watanabe
National Institute for Fusion Science

Date submitted: 12 Sep 2013

Electronic form version 1.4