

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Alpha particle transport in the presence of toroidal driftwaves

Y. NISHIMURA, B. HUANG, C.Z. CHENG, Institute of Space and Plasma Sciences, National Cheng Kung University — Transport of fusion born α particles is investigated in the presence of poloidally mode coupled ballooning type driftwaves.¹ The onset of orbit stochasticity is understood as an overlapping of electric islands² produced by the driftwaves, whose overlapping threshold is lower for the thermal particles than for the α particles (high energy particles). For the trapped particles, transport is determined by the particles' sensitive response to the fluctuation at the banana tip where the parallel velocity decreases drastically. Time dependent turbulent signals (finite ω_* effects) give rise to the shift of the resonant radial locations, which again is larger for the thermal particles than the high energy particles. The transport process is influenced by the microscopic structure of the islands, which deviates from the Gaussian process. This work is supported by National Science Council of Taiwan, NSC 100-2112-M-006-021-MY3 and NCKU Top University Project.

¹C.Z.Cheng, Phys. Fluids **25**, 1020 (1982); *ibid.*, **23**, 1770 (1980).

²B.Weyssow, J.H.Misguich, R.Balescu, Plasma Phys. Controlled Fusion **33**, 763 (1991).

Yasutaro Nishimura
Institute of Space and Plasma Sciences, National Cheng Kung University

Date submitted: 12 Jul 2013

Electronic form version 1.4