

Abstract Submitted
for the DPP06 Meeting of
The American Physical Society

Vlasov-Fokker-Planck simulation of transport in magnetically turbulent plasmas¹ WILLIAM HORNSBY, R.J. KINGHAM, A.R. BELL, Imperial College London, R.O. DENDY, EURATOM/UKAEA Fusion Association Culham — The author presents kinetic simulations of the effect of multi-mode magnetic turbulence on cross-field transport. We have developed and fully benchmarked a finite-difference code that solves the Vlasov-Fokker-Planck equation in three spatial dimensions. It utilises the spherical harmonic expansion of the distribution function in velocity space, a technique previously used successfully in codes to study Laser-Plasma interactions [1]. In contrast to previous work using particle tracking codes, our code allows the arbitrary control of collisionality and does not suffer from statistical noise. We are currently investigating the nature of the cross-field transport in a regime relevant to magnetically confined plasmas, and in particular, the effect of magnetic turbulence. The code allows us to study regimes where Quasi-Linear theories are no longer valid, for example, when the turbulence length scales are comparable to the Larmor radius and have a large mode amplitude.

[1] A R Bell et al 2006 Plasma Phys. Control. Fusion 48 R37-R57

¹Work supported jointly by the EPSRC and UKAEA Culham

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Date submitted: 21 Jul 2006

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