Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Quasilinear theory revisited: general kinetic formulation of wave-particle interactions in plasmas[1] K. HIZANIDIS, Y. KOMINIS, NTUA, Greece, A.K. RAM, PSFC, MIT — In fusion plasmas, radio frequency (RF) waves are being commonly used for heating the plasma and for generating plasma currents. RF waves impart energy and momentum to particles through wave-particle interactions. These interactions bring about changes in the distribution function of the particles. We have recently formulated a theory for the evolution of the distribution function due to wave-particle interactions in which the waves are coherent RF waves [1,2]. The formalism takes into account the complexity of the dynamical phase space of the particles in the presence of waves. The diffusion coefficient is time dependent which is distinctly different from the one used in traditional quasilinear theories. We will present our formalism and compare the results with those obtained from the usual quasilinear theories.

[1] Y. Kominis, A.K. Ram and K. Hizanidis, *Phys. Plasmas* **15**, 122501 (2008).
[2] Y. Kominis, A.K. Ram and K. Hizanidis, *Phys. Rev. Lett.* **104**, 235001 (2010).

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Date submitted: 22 Jul 2010   Electronic form version 1.4