Abstract Submitted
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Kinetic evolution of electron distribution function in presence of RF waves[1] Y. KOMINIS, NTUA, Athens, Greece, A.K. RAM, PSFC, MIT, K. HIZANIDIS, NTUA, Athens, Greece — Radio frequency (RF) waves are routinely used to modify the current profile in tokamaks. In ITER, electron cyclotron waves will be used for such a purpose. We have formulated a kinetic description for the evolution of the electron distribution function f_e in the presence of RF waves in a tokamak magnetic geometry [1]. The evolution of f_e and the electron orbits is treated simultaneously, so that the evolution equation for f_e is a functional mapping. This is useful as the electron phase space is inhomogeneous and bounded. All possible electron orbits, correlated and uncorrelated, are properly included. We use action-angle variables of an axisymmetric toroidal plasma. If we assume that f_e is randomly distributed in one or all of the angles, a diffusion-like equation for the evolution of f_e is obtained. The diffusion coefficient is time dependent and non-singular. In the limit of infinite time, we obtain the usual, singular, quasilinear diffusion coefficient. However, this description is incorrect as the time scale for the evolution of f_e is inconsistent with the infinite time scale for determining the diffusion coefficient. The consequences of our description on the evolution of f_e will be discussed.
[1] Y. Kominis et al., Phys. Plasmas **15**, 122501 (2008).

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