Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Nonlinear ponderomotive force by electron cyclotron waves and current drive efficiency[1] CESAR GUTIERREZ-TAPIA, Instituto Nacional de Investigaciones Nucleares, Mexico, MONICA BELTRAN-PLATA, Instituto de Fisica, UGTO, Mexico — Electron cyclotron current drive (ECCD) experiments in tokamaks require high power radiation sources capable of making some nonlinear effects. The question remains of whether higher efficiencies in plasma current driving can be achieved via ponderomotive forces. We explore the effects associated to inhomogeneities of a high-frequency field amplitude. The neoclassical transport theory is applied in order to calculate the electron cyclotron current drive in a ponderomotive potential (in the kinetic formalism) assuming an axisymmetric tokamak in the low-collisionality regime. The tokamak ordering is used so to obtain a system of equations describing the plasma dynamics. It is shown that, in spite of the fact that a mixing mechanism including the resonance effect and the nonlinear ponderomotive potential is always present, the resonance effect remains as the dominant one when driving a current.

[1]Work partially supported by project CONACYT 53076-F.

Cesar Gutierrez-Tapia
Instituto Nacional de Investigaciones Nucleares, Mexico

Date submitted: 17 Jul 2008 Electronic form version 1.4