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Control of electron energy distribution function by high frequency fields and by the effect of crossed magnetic field ZORAN PETROVIC, Institute of Physics, University of Belgrade, PO Box 68, 11080 Belgrade, SASA DUJKO, Centrum Wiskunde and Informatica (CWI), PO Box 94097, 1090 GB Amsterdam, The Netherlands, RONALD WHITE, ARC Centre for Antimatter-Matter Studies, School of Electrical Engineering and Physical Sciences, James Cook University, 4810 Townsville, Australia — Ensembles of electrons can have collective transport properties even when there is no coupling between individual particles either through Coulomb force or through collisions with products of previous collisions. A number of these kinetic effects were identified and mostly explained recently. In particular combinations of time varying fields and cross sections present the opportunity to control the shape of the electron energy distribution functions (EEDF) and specific time dependences of collisional rates and transport coefficients. The energy coupling from external field to charged particles may thus be controlled and enhanced. For example, it is possible to control the transport of electrons, producing negative transient diffusion through a suitable time varying external magnetic field, and producing negative average velocity (flux drift velocity) through enhanced non-conservative processes. Time dependent electric and magnetic fields may be in particular useful in controlling the behavior of electrons giving new possibilities to modify energy coupling into collisional non-equilibrium plasma.

Zoran Petrovic
Institute of Physics, University of Belgrade, PO Box 68, 11080 Belgrade

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