

Abstract Submitted
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Physical Mechanisms of the Electron Energy Distribution Function Control in Inhomogeneous Non-stationary Plasma¹ ANATOLY KUDRYAVTSEV, St.Petersburg State University, LEV TSENDIN, SPbSPU — To predict the main scenarios of electron distribution function (EDF) control, first of all it is necessary to develop a kind of roadmap of formation a different modes of the EDF in the inhomogeneous unsteady plasma. The analysis shows that the time scales are determined by the ratio between the transient time t_L (the characteristic time of electron transport through the plasma volume) and the relaxation times t_e of the EDF momentum t_m (on velocity direction) and energy. Accordingly, for the spatial variable it is the ratio between the characteristic size of plasma L and an electron mean free path l (momentum relaxation) and a length of energy relaxation of electron energy l_e . A significant difference between the scale of momentum relaxation and energy $t_e \gg t_m$, $l_e \gg l$ (reaching two or more orders of magnitude), allows to predict the possible modes of the EDF formation, with various degrees of selectivity effects on different groups of electrons (from a local EDF when $L \gg l_e$ and it is possible to affect only the entire ensemble of electrons) and the nonlocal EDF, when $L \ll l_e$ and different groups of electrons behave independently of each other and it is possible to influence only on the interest profiles.

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