The charging of dust particles in ionospheric plasma with non-Maxwellian electrons

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The distribution function of electrons in non-equilibrium dusty ionosphere heated by high power radio waves [1] was investigated in this work. The electron current to the individual dust particle on the basis of kappa-distribution [2,3] was searched. It was shown that the intensity of electrons flux in non-equilibrium case could exceed the electrons current at stationary state for many times. Calculations was made for the ionospheric plasma at the heights of 85 km with temperature 150^0K and concentration of electrons and ions about 10^{10} m^{-3}. The frequency of ions is about 10^5 s^{-1}. The dusty particles assumed of one size are about 10 nm. As far as OML theory couldn't be used for simulation of dust particles charging in this case due to openness character of heating dust layer of mesosphere it was concluded that we need to develop the model of dusty particles charging which takes into account the non-equilibrium processes in considered problem.

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