

# External electric field effect on the motion of a charged particle in a linear electrodynamic trap

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Management of behaviour and determination of statistical properties of the Coulomb structure of micron-sized singly charged dust particles in an electrodynamic trap is one of the main tasks in the experimental study of single-charged plasma, in the creation of filtration and purification devices and in the development of new technologies. In the previous works we have determined the boundaries of retention regions and the emergence of instability of charged particle motion. In the case of imposing an additional electric field, charged particles located on both sides of the stability boundary can react in two ways, depending on the polarity and phase of the applied voltage. The particle inside the trap can either leave the trap or remain in it. A particle beyond the stability boundary without an additional electric field will leave the trap, however, when an additional influence is applied, it may start to move along the stable trajectory. In this work, a two-dimensional trajectory of a charged particle of micron dimensions in a horizontal quadrupole linear electrodynamic trap under the influence of an alternating external electric field in air at atmospheric pressure has been computer modelled. The trajectories of stable motion of the particle in the trap at the stability boundary are obtained and the corresponding parameters of the alternating external electric field are determined. The obtained results are important for further investigation of the influence of external influences on the Coulomb structures of charged dust particles in electrodynamic traps in air at atmospheric pressure.