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Spatial Confinement of Microobjects in the Radiofrequency Ion Trap in a Viscous Medium*

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In the present article a spatial confinement of microobjects were explored in the radiofrequency Paul trap at normal pressure. Spores of Lycopodium Clavatum, 33 μm in diameter, and CdSe/ZnS (core/shell) quantum dots conglomerates with size of 2–7 μm were used as such microobjects. Zero-crossing orbits of these objects were observed for the first time what indicates the nonlinear nature of dynamics of these particles in localization area. Mathematical descriptions of particle dynamics in a viscous is presented. It is shown that friction value depends on the radius of microobjects and dynamic viscosity. Moreover, zero-crossing orbits of charged particles in the radiofrequency Paul trap were numerically simulated. A new method of comparative analysis of the morphology of microparticles is proposed.

Keywords: ion traps, non-linear dynamic, mass-spectrometry, biological objects.

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