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Aqueous, electrolytic Paul mictrotrap for control of biomolecules[1]

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We study dynamical trapping of the individual charged particles in an aqueous, electrolytic environment by a 2D quadrupole field of a microscale Paul nanotrap. Influence of the drag forces as well as of effective field of the electrolyte sub-system and thermal fluctuations to the stable confinement boundaries in the parametric space of the trap was investigated by solving the generalized Mathieu equation. The results of the theoretical analysis provided satisfactory comparison with the experimental observations at a planar aqueous electrodynamic trap on a chip, demonstrating a possibility for aqueous, electrolytic trapping and control of single bio-molecular ions.

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