

Trapping of microparticles by a pulsed periodic rectangular voltage quadrupole trap

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The influence of a rectangular voltage waveform on the trapping of micron-sized dielectric charged particles in an electrodynamic quadrupole trap in air has been examined experimentally and theoretically for the first time. We compare the lower trapping limit for the trap with rectangular and sinusoidal voltage waveforms. Microparticle trajectories for two voltage waveforms at different amplitudes were calculated. According to experiments and calculations, with rectangular voltage form, the trap holds particles at a lower voltage amplitude than with sinusoidal form, and their trajectories are more stable.

Keywords: charged particles, linear electrodynamic quadrupole trap, particle trapping, trajectories of motion, air at atmospheric pressure, rectangular voltage.

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