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【435】 Quantum control of levitated nanoparticles

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Owing to its excellent isolation from thermal environment, an optically levitated silica nanoparticle in ultra-high vacuum is a strong candidate to observe quantum behavior of massive objects at room temperature, with applications ranging from sensing to testing fundamental physics. With the help of a new, non-standard cavity interaction –cavity cooling by coherent scattering –we have achieved a first step toward full quantum control of the nanoparticle motion: quantum ground state cooling. I will present our recent results on cavity interaction and discuss prospects of creating macroscopic quantum states with levitated nanoparticles.

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