

# Cavity cooling of silicon nanoparticles

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Cavity assisted laser cooling has been successfully applied to single atoms[1], ions[2] and atomic ensembles[3,4]. It is however, most indispensable for nanoparticles, where direct laser cooling techniques are not applicable. We demonstrate far off-resonant cavity cooling of a silicon particle with a reduction of the transverse kinetic energy by a factor of over 30 [5]. Laser induced acoustic desorption launches the nanoparticles beneath a high finesse cavity in high vacuum environment. While the particles transit through the intense cavity field the transverse velocity is reduced. By detecting the scattered light from the particle we can trace its movement in real time. Advancing this technique is crucial to enable quantum coherence experiments with nanoparticles.

## References

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