physikalisches Kolloquium

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Experimental realization of a single-ion heat engine

Mo. 14.11.16
16:00 Uhr
Ort: H34

Thermodynamic machines can be reduced to the ultimate atomic limit [1], using a single ion as a working agent. The confinement in a linear Paul trap with tapered geometry allows for coupling axial and radial modes of oscillation.

The heat-engine is driven thermally by coupling it alternately to hot and cold reservoirs, using the output power of the engine to drive a harmonic oscillation [2].

From direct measurements of the ion dynamics, the thermodynamic cycles for various temperature differences of the reservoirs can be determined [3] and the efficiency compared with analytical estimates.

[1] J. Rossnagel et al., „A single-atom heat engine“, Science 352, 325 (2016).
[2] O. Abah et al., Phys. Rev. Lett. 109, 203006 (2012).
[3] J. Rossnagel et al., New J. Phys. 17, 045004 (2015)