Title:	Temperature-dependent maximization of work and efficiency in a degeneracy-assisted quantum Stirling heat engine.
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Keywords:	Heat engines Quantum thermodynamics
Issue Date:	2021
Publisher:	American Physical Society
Citation:	Physical Review E, 103(6).
Abstract:	We propose a quantum Stirling heat engine with an ensemble of harmonic oscillators as the working medium. We show that the efficiency of the harmonic oscillator quantum Stirling heat engine (HO-QSHE) at a given frequency can be maximized at a specific ratio of the temperatures of the thermal reservoirs. In the low-temperature or equivalently high-frequency limit of the harmonic oscillators, the efficiency of the HO-QSHE approaches the Carnot efficiency. Further, we analyze a quantum Stirling heat engine with an ensemble of particle-in-a-box quantum systems as the working medium. Here both work and efficiency can be maximized at a specific ratio of temperatures of the thermal reservoirs. These studies will enable us to operate the quantum Stirling heat engines at its optimal performance. The theoretical study of the HO-QSHE would provide impetus for its experimental realization, as most real systems can be approximated as harmonic oscillators for small displacements near equilibrium.
Description:	Only IISER Mohali authors are available in the record.
URI:	https://doi.org/10.1103/PhysRevE.103.062109 (https://doi.org/10.1103/PhysRevE.103.062109) http://hdl.handle.net/123456789/5196 (http://hdl.handle.net/123456789/5196)
Appears in Collections:	Research Articles (/jspui/handle/123456789/9)

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