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# Measuring the heat exchange of a quantum process

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## Abstract

Very recently, interferometric methods have been proposed to measure the full statistics of work performed on a driven quantum system. The advantage of such schemes is that they replace the necessity to make projective measurements by performing phase estimation on an appropriately coupled ancilla qubit. These proposals are one possible route to the tangible experimental exploration of quantum thermodynamics, a subject which is the centre of much current attention due to the current control of mesoscopic quantum systems. In this Letter we demonstrate that a modification of the phase estimation protocols can be used in order to measure the heat distribution of a quantum process. In addition we demonstrate how our scheme may be implemented using ion trap technology. Our scheme should pave the way for the first experimental explorations of the Landauer principle and hence the intricate energy to information conversion in mesoscopic quantum systems.

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