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Title: Non-Markovian effects on the performance of a quantum Otto refrigerator

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Abstract :

Thermodynamics plays an important role in science and engineering. It was introduced at the start of the industrial revolution and applied to the design of a wide variety of large scale useful devices, from refrigerators to solar cells. Nowadays, technological progress is increasingly miniaturized at the nanoscale and in the quantum regime, where thermal fluctuations compete with quantum fluctuations. Moreover, quantum thermal machines have been a focus of active research in the last decade for describing fundamental concepts at the nanoscale. Hence, it is important to study how thermodynamic quantities like work, heat and power can be significantly attributed to the familiar processes of quantum information theory. Afterwards, we move towards the development of autonomous systems to study different thermodynamic quantities. We investigate the non-Markovian effects of the reservoirs used to extract cooling from an autonomous refrigerator machine**.**