

Quantum Thermodynamics of An Atom-cavity System with Jaynes-Cummings Interaction

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Abstract

In this paper, we introduce the idea of quantum thermodynamics, using only basic concepts from quantum and statistical mechanics. Then, we discuss the framework of non-equilibrium processes in quantum systems. We then apply these results to the problem of atom-cavity system while their interaction is described by Jaynes-Cummings model. Here, we introduce the concept of quantum thermodynamics of close quantum system and so by considering a good cavity, coupling of cavity modes with its reservoir has been omitted.

Keywords: Quantum thermodynamics, Atom-cavity, Average work, Irreversible entropy.

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