Extracting mechanical work from quantum engines

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In this work, we introduce a model of a quantum engine that utilizes an opto-mechanical system described by the canonical Jaynes-Cummings model. By harnessing the radiation pressure of the cavity to set a mesoscopic piston in motion, our model enables the extraction of mechanical work. To ensure thermodynamic consistency, we compare our model to the established definitions of work and heat proposed by Alicki. We then apply our model to study the Otto and Carnot cycles and evaluate the performance of both engines.

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