Title:	Performance of Feynman's ratchet under a trade-off figure of merit: exact analysis versus estimation from prior information
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Abstract:	We study the optimal performance of Feynman's ratchet and pawl system operating as a heat engine (refrigerator), by optimizing the product of efficiency (coefficient of performance) and power output (cooling power), which is known as the efficient power (-criterion) in the literature. The analysis is performed by recourse to two different methods: the first employs an exact optimization over the internal energy scales of the device, and the second method is based on the use of prior information to estimate the optimal performance of the device. From the two-parameter optimization, universal features of the efficiency at maximum efficient power (EMEP) are shown. Then, an exact one-parameter optimization is carried out for the linear model of the engine in high temperature regime, by constraining one of the energy scales, and well-known forms of efficiency are obtained. Further, using the prior information approach, the obtained efficiency concurs with the EMEP of an endoreversible heat engine. An analogous analysis is carried out for the Feynman's ratchet as a refrigerator. From the estimated behavior of the device under limited information, we are able to highlight universal features of its performance that remain robust under an inference analysis.
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