Title:	Prior information and inference of optimality in thermodynamic processes
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Abstract:	We propose a Bayesian inference rule to derive the prior distribution function for a constrained thermodynamic process with incomplete information. Based on this prior, we develop procedures to estimate the work extracted from a heat engine operating between two finite reservoirs. In particular, we find that the optimal work extractable can be inferred with very good agreement which extends to the far-from-equilibrium regime. The estimate for efficiency is shown to follow a universal behavior beyond the linear response term, η ≈ ηc/2 + (ηc)2/8, where ηc is the Carnot bound. Estimation of this feature can be ascribed to a symmetry with respect to different allowed inferences, with each assigned an equal weight. In contrast to finite-time irreversible models considered in the literature, this universality holds for a reversible model of a heat engine but with incomplete information.
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