Title:	Bounds on thermal efficiency from inference
Authors:	Johal, R.S. (/jspui/browse?type=author&value=Johal%2C+R.S.)
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Abstract:	We consider reversible work extraction from two finite reservoirs of perfect gases with given initial temperatures T+ and T−, when the final values of the temperatures are known but they can be assigned to specific reservoirs only probabilistically. Using inference, we characterize the reduced performance resulting from this uncertainty. The estimates for the efficiency reveal that uncertainty regarding the exact labels reduces the maximal efficiency below the Carnot value, its minimum value is the well known Curzon-Ahlborn value: 1−T−/T+‾‾‾√. We also estimate the efficiency when even the value of temperature is not specified, by finding a suitable prior distribution for this problem. For the case of maximal uncertainty in the labels, we find the average estimate for efficiency drops to one-third value of Carnot limit. Using the concavity property of efficiency, we find the upper bound for the average estimate to agree with the CA-value upto two lowest order terms in the expansion near equilibrium.
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