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Title:	Feynman's Ratchet and pawl with ecological criterion: Optimal performance versus estimation with Prior information
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Abstract:	We study the optimal performance of Feynman's ratchet and pawl, a paradigmatic model in nonequilibrium physics, using ecological criterion as the objective function. The analysis is performed by two different methods: (i) a two-parameter optimization over internal energy scales; and (ii) a one-parameter optimization of the estimate for the objective function, after averaging over the prior probability distribution (Jeffreys' prior) for one of the uncertain internal energy scales. We study the model for both engine and refrigerator modes. We derive expressions for the efficiency/coefficient of performance (COP) at maximum ecological function. These expressions from the two methods are found to agree closely with equilibrium situations. Furthermore, the expressions obtained by the second method (with estimation) agree with the expressions obtained in finite-time thermodynamic models
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