

Abstract Submitted  
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**A dissipation bound for thermodynamic control** BENJAMIN MACHTA, Princeton Univ — Biological and engineered systems operate by coupling function to the transfer of heat and/or particles down a thermal or chemical gradient. In idealized *deterministically* driven systems, thermodynamic control can be exerted reversibly, with no entropy production, as long as the rate of the protocol is made slow compared to the equilibration time of the system. Here we consider *fully realizable, entropically driven* systems where the control parameters themselves obey rules that are reversible and that acquire directionality in time solely through dissipation. We show that when such a system moves in a directed way through thermodynamic space, it must produce entropy that is on average larger than its generalized displacement as measured by the Fisher information metric. This distance measure is sub-extensive but cannot be made small by slowing the rate of the protocol.

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