

A non-equilibrium system as a demon

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Maxwell demons are creatures that are imagined to be able to reduce the entropy of a system without performing any work on it. Conventionally, such a Maxwell demon's intricate action consists in measuring individual particles and subsequently performing feedback. Here we show that much simpler setups can still act as demons: we demonstrate that it is sufficient to exploit a non-equilibrium distribution to seemingly break the second law of thermodynamics. We propose both an electronic and an optical implementation of this phenomenon, realizable with current technology.