

Non-equilibrium systems as demons

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Maxwell demons cause an apparent violation of the second law of thermodynamics, typically based on detailed detection of internal dynamics and feed-back mechanisms. We show theoretically that non-equilibrium systems can act as much simpler demons with the same effect. These are much more amenable for experimental applications than the Maxwell version, because there is no requirement for the detection of individual particle dynamics in the macroscopic working fluid, nor for feedback. A simple experimental implementation is proposed based on quantum Hall edge states, but can be analogously tested in optical setups.

[1] R. Sánchez, J. Splettstoesser, and R. S. Whitney, arXiv:1811.02453.