

Thermodynamics of a Physical Model Implementing a Maxwell Demon

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We present a physical implementation of a Maxwell demon which consists of a conventional single electron transistor (SET) capacitively coupled to another quantum dot detecting its state. Altogether, the system is described by stochastic thermodynamics. We identify the regime where the energetics of the SET is not affected by the detection, but where its coarse-grained entropy production is shown to contain a new contribution compared to the isolated SET. This additional contribution can be identified as the information flow generated by the “Maxwell demon” feedback in an idealized limit.

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