

Autonomous thermal motors

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We present a minimal model of autonomous thermal motor, made of two interacting Brownian particles, sitting on two periodic potentials, and kept at different temperatures. We show that such a system does not require ratchet potentials (with, e.g., an asymmetric saw-tooth shape) in order to exhibit direct transport, but presents a spontaneous symmetry breaking.

Both the dynamic and thermodynamic properties of the model are discussed.

We find that while the model can be solved exactly in the limit of strong coupling between the particles, the optimal operation regime occurs at moderate coupling strength.

[1] A. Imparato, H. Fogedby, in preparation.