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Molecular Dynamics simulation of Buttiker-Landauer ratchet
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— A position dependent temperature profile in presence of a periodic potential leads to directed current of Brownian particles, commonly known as Buttiker-Landauer ratchet. Onsager symmetry tells us that inhomogeneous temperature profile can be generated by reversing the Buttiker-Landauer ratchet. When Brownian particles driven by a constant external force cross over the potential barrier, they carry heat from one side to the other. Hence, starting with uniform temperature the flow of Brownian particles induces inhomogeneous temperature profile. We investigate this phenomenon using first principles molecular dynamics simulations as well as the phenomenologial Langevin equation.

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