

[P2] Efficiency at maximum power in a linear Brownian heat engine model

Hyun-Myung Chun, University of Seoul

We consider underdamped Langevin dynamics of two particles which are trapped by a harmonic potential and driven by a linear external driving force. Each particle is in contact with a heat bath at different temperatures T_1 and T_2 ($T_2 < T_1$), respectively. For an appropriate external force, the system acts as an autonomous heat engine performing work against the external force. We find analytically that the efficiency at maximum power of this model is given by $\eta_{mp} = 1 - T_2/T_1$, which is equal to the so-called Curzon-Ahlborn efficiency. We show that the Curzon-Ahlborn efficiency is originated from the universal relation between the entropy productions of two heat baths.