[P7] Efficiency at Maximum Power of a Brownian Heat Engine without Endoreversible Condition

Hyun-Myung Chun, University of Seoul

We consider a coupled two-particle Langevin system as a heat engine. Each particle is respectively in contact with a heat bath at different temperatures and they are acted on by external driving forces. By tuning the external forces, the system can absorb heat from the hotter heat bath and work against the external force, hence the system can be regarded as an autonomous heat engine in steady state. For the case of the linear force, the exact form of the power and the efficiency in steady state are obtained analytically. Under a suitable condition, the efficiency at maximum power of this model is given by $1-\sqrt{T_2/T_1}$, which is called Curzon-Ahlborn efficiency. It has been understood that the Curzon-Ahlborn efficiency requires endoreversible condition. Our study shows that the Curzon-Ahlborn efficiency at maximum power can be reproduced without the endoreversible condition.