Tutorial – Fluctuation theorems in classical systems in contact with several baths: theory and experiments

Alberto Imparato[*†1]

[1]University of Aarhus – Denmark

Abstract

I will discuss the physical properties of the heat flowing through systems in contact with heat baths at different temperatures. I will introduce and discuss the fluctuation theorem that sets precise constraints on the fluctuations of the heat transfer between the different reservoirs. I will then show some experimental results for a system formally equivalent to a harmonic chain with different heath baths, and show that a conservation law for the total entropy exists. Finally, I will discuss the general case of a system in contact with multiple energy and particle baths, and show that there exists a fluctuation theorem that involves only the energy and the particle currents and that holds at any time. I will show some recent experimental results confirming this last theorem.

[*]Speaker
[†]Corresponding author: imparato@phys.au.dk