Frontier of Statistical Physics and Information Processing 2013

On the thermodynamic cost of sensing in autonomous systems

Massimiliano Esposito
Complex Systems and Statistical Mechanics, University of Luxembourg, L-1511 Luxembourg, Luxembourg

I will analyse the thermodynamic cost of a sensing (or measurement) process in autonomous systems using stochastic thermodynamics. The connection to the mutual infomation, which is used to study such processes in non-autonomous systems, will be discussed. Applications to electronic and biological sensing will be provided.

[1] M. Esposito, "Stochastic thermodynamics under coarse-graining", Phys. Rev. E 85, 041125 (2012).
[2] M. Esposito and G. Schaller, "Stochastic thermodynamics for 'Maxwell demon' feedbacks" EPL 99, 30003 (2012).
[3] P. Strasberg, G. Schaller, T. Brandes and M. Esposito, "Thermodynamics of a physical model implementing a Maxwell demon", Phys. Rev. Lett. **110**, 040601 (2013).
[4] To appear.