

Finite-time Information Erasure (in Classical and Quantum Systems)

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Finite-time information erasure is of interest in both classical and quantum problems. Slow erasure protocols that begin from an equilibrium state pay a thermodynamic cost equal to the Landauer bound per bit of information, but this is no longer the case for faster erasure protocols or protocols that begin from an out-of-equilibrium state. What sort of bounds exist for such scenarios is a topic of current interest. In this talk, we will discuss some of our recent work on this problem, where information erasure is caused by the time-dependent stiffening of a harmonic trap which takes any initial state to the equilibrium state in the final trap configuration. This problem (in different guises) has been extremely well studied in the past and we will discuss some of our new results in comparison to what was known earlier. Some interesting aspects of information erasure in a qubit will also be discussed.

[1] D. Gupta, K.S. Olsen and S. Krishnamurthy, *Comm. Phys*, 8, 355 (2025).

[2] P. Nayak, S. K. Manikandan, T. Van Vu and S. Krishnamurthy, *arXiv:2602.00227* (2026)