

Information-to-measurement conversion in DNA pulling experiments with feedback: from protocols to strategies

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Single-molecule experiments permit us to experimentally test fundamental results in the thermodynamics of information in the nanoscale [1]. Recently, we introduced a continuous Maxwell demon based on multiple measurements of a sDNA hairpin pulled with optical tweezers [2,3]. Here, I discuss the novel case of discrete and continuous feedback protocols for dissipation reduction and improved free energy determination (information-to-measurement conversion) in DNA pulling experiments [4]. It is found that a feedback strategy (defined as a correlated sequence of feedback protocols) remarkably reduces dissipation enhancing information-to-measurement efficiency. The study underlines the role of temporal correlations to develop feedback strategies for efficient information-to-energy conversion in small systems.

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