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Optimal processes measurements in a dynamically modulated optical tweezers system

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This study investigates optimal protocols in the mesoscopic regime, focusing on processes designed to minimize dissipated energy. Our approach involves the use of dynamically modulated optical tweezers. Specifically, we explore the time-dependent stiffness control of the trap, as proposed by Schmiedl and Seifert (1) and our group (2), and analyze the effects of various control parameters, such as the amplitude of modulation and switching time. By comparing the measured stochastic work distributions of the optimal protocols with linear (suboptimal) ones, we have obtained preliminary results that confirm the advantage of optimal protocols. (3) These results demonstrate that the average work of optimal protocols is consistently lower than linear protocols in all the parameters studied.

Palavras-chave: Optical tweezers. Optimal protocols. Stochastic Thermodynamics.

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