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Effective Temperature: from Red-Blood-Cell Membrane Fluctuations to trapped active particles EYAL ISAAC BEN ISAAC, NIR GOV, None
— Biologically driven nonequilibrium fluctuations are often characterized by their non-Gaussianity or by an "effective temperature", which is frequency dependent and higher than the ambient temperature. We address these two measures theoretically by examining a randomly kicked particle, with a variable number of kicking motors, and show how these two indicators of nonequilibrium behavior can contradict. Our results are compared with new experiments on shape fluctuations of red-blood cell membranes, and demonstrate how the physical nature of the motors in this system can be revealed using these global measures of nonequilibrium. Furthermore, oure concept of The concept of the effective temperature is extended to active particles trapped in a potential well. We calculated the average escape time and find that Kramers' reaction-rate theory is found to quite hold in this system. Using this calculated escape time, together with the exact calculation of the active diffusion coefficient for the escaped (free) active particle; one can attempt to fully describe the long-time random-walk of the tracer particle in the active gel.

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None

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