

Anomalous relaxation of a Brownian particle in active baths

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We investigate a Brownian particle confined in an active heat bath and report on the non-monotonic cooling behavior while the system approaches the final steady state. This effect is especially pronounced as the correlation time of the active noise, associated with the random kicks by the active particles, becomes longer compared to the relaxation time of the damped harmonic oscillator in an otherwise thermal bath. Introducing the effective temperature scheme, where the fluctuation-to-dissipation ratio is the proxy for nonequilibrium temperature, we analyze the anomalous relaxation process in the light of stochastic thermodynamics.