Brownian motion in confinement

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Abstract

Brownian motion in confinement is a paradigm for numerous biological situations. Here, we study the diffusion of micrometer-sized beads in water confined between two walls that are separated by a micrometric distance. Using holographic microscopy, we track the particles in three dimensions with a precision approaching the nanometric range. From statistical analysis performed on the individual trajectories, we extract the local (i.e. not averaged) diffusion coefficient as a function of the position of the bead in the microcavity. The experimental results are in good agreement with the numerical and analytical predictions - which paves the way towards the study of other situations of confinement.

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