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## Colossal Brownian yet non-Gaussian diffusion in a periodic potential: impact of nonequilibrium noise amplitude statistics

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In [Phys. Rev. E 102, 042121 (2020)] the authors studied an overdamped dynamics of nonequilibrium noise driven Brownian particle dwelling in a spatially periodic potential and discovered a novel class of Brownian, yet non-Gaussian diffusion. The mean square displacement of the particle grows linearly with time and the probability density for the particle position is Gaussian, however, the corresponding distribution for the increments is non-Gaussian. The latter property induces the colossal enhancement of diffusion, significantly exceeding the well known effect of giant diffusion. Here we considerably extend the above predictions by investigating the influence of nonequilibrium noise amplitude statistics on the colossal Brownian, yet non-Gaussian diffusion. The tail of amplitude distribution crucially impacts both the magnitude of diffusion amplification as well as Gaussianity of the position and increments statistics. Our results carry profound consequences for diffusive behaviour in nonequilibrium settings such as living cells in which diffusion is a central transport mechanism.

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