

## Low-Resistant Band-Passing Noise and Its Dynamical Effects

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Abstract: We propose an  $n$ -order noise, which is realized by driving an  $n$ -order linear differential equation with a Gaussian white noise. The time-derivative noise is a low-resistant band-passing noise. If the derivative noise is regarded as a thermal one, the system has a vanishing effective friction and it should induce ballistic diffusion of a free particle at long times. The simulation method for the generalized Langevin equation driven by the  $n$ -order noise is discussed systematically. The features of three-order derivative noises are presented when they are applied to a ratchet system.

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Key words:  $n$ -order noise, ballistic diffusion, Langevin simulation, ratchet system

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