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Coupling probabilistic approaches for fractional process diffusion.

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Abstract

This paper characterizes the limiting dynamics of a stochastic differential equation (SDE) driven by fractional Brownian motion (fBm). We investigate a critical scaling regime where the homogenization parameter (δ) and the large deviations parameter (ϵ) tend to zero simultaneously, such that their ratio δ/ϵ converges to a positive constant $\gamma > 0$. Furthermore, we analyze the impact of the long-range dependence inherent in fractional Brownian motion on the associated rate function and the convergence speed of the solution.

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