Siegert

Local Lyapunov Exponents

Sublimiting Growth Rates of Linear Random Differential Equations

Establishing a new concept of local Lyapunov exponents the author brings together two separate theories, namely Lyapunov exponents and the theory of large deviations.

Specifically, a linear differential system is considered which is controlled by a stochastic process that during a suitable noise-intensity-dependent time is trapped near one of its so-called metastable states. The local Lyapunov exponent is then introduced as the exponential growth rate of the linear system on this time scale. Unlike classical Lyapunov exponents, which involve a limit as time increases to infinity in a fixed system, here the system itself changes as the noise intensity converges, too.

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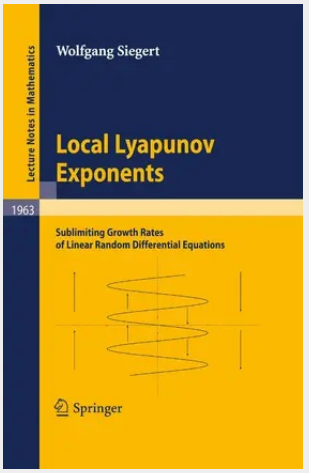

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