

MOMENT ATTRACTIVITY, STABILITY AND CONTRACTIVITY EXPONENTS OF STOCHASTIC DYNAMICAL SYSTEMS

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Abstract. Nonlinear stochastic dynamical systems as ordinary stochastic differential equations and stochastic difference equations are in the center of this presentation in view of the asymptotic behavior of their moments. We study the exponential p -th mean growth behavior of their solutions as integration time tends to infinity. For this purpose, the concepts of attractivity, stability and contractivity exponents for moments are introduced as generalizations of well-known moment Lyapunov exponents of linear systems. Under appropriate monotonicity assumptions we gain uniform estimates of these exponents from above and below. Eventually, these concepts are generalized to describe the exponential growth behavior along certain Lyapunov-type functionals.

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