

BENEMÉRITA UNIVERSIDAD AUTÓNOMA DE PUEBLA INSTITUTO DE FÍSICA

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“High-order additive Markov chains and random telegraph processes with nonlocal memory”

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Resumen

Random systems exhibiting long-range spatial and/or temporal correlations remain to be on the top of intensive research in physics, as well as in theory of dynamical systems and in theory of probability. Nature offers a large number of examples of random processes.

We explore statistical properties of high-order Markov chains, addressing the curse of dimensionality problem by introducing the additive Markov chain model. It simplifies the conditional transitive probability function providing effective methods for study the correlation properties of random sequences.

It will be shown that the telegraph processes can be considered as generalization to continuous variable of a discrete-time random binary higher-order sequence. We obtain a solution of integral equation connecting memory and pair correlation functions in the analytical closed-form. The exponential memory function makes it possible to present the solution in a simple expression. The conditions of process stationarity were found. It is shown that the pair correlation function can be of two types: either exponentially decreasing with two decrements or exponentially decreasing with an oscillating amplitude.

Auditorio del Instituto
Viernes 27 de septiembre de 2024
13:00 hrs