

Author(s):

Vygintas Gontis, Institute of Theoretical Physics and Astronomy, Vilnius University, Sauletekio al. 3, 10257 Vilnius, Lithuania

Abstract title:

Non-extensive birth-death processes as an origin of spurious long-range memory birth-death processes as an origin of spurious long-range memory.

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Models of the population or opinion dynamics often are introduced as the continuous time Markov chains. A macroscopic dynamics in such models usually results in non-linear stochastic differential equations (SDEs) exhibiting spurious long-range memory. This category of models is as an alternative to the models built using fractional Brownian motion (fBm) and exhibiting real long-range memory property. We propose a general form for probability density function (PDF) of return time applicable to the continuous time birth-death processes. This PDF might be used to discriminate between spurious memory and real long-range memory in various non-equilibrium systems.