

Investigation of stochastic processes related to partial differential equations with random initial conditions

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The talk presents results on sample paths properties of some classes of φ -sub-Gaussian processes related to partial differential equations with random initial conditions.

The talk is based on the results obtained in the joint papers with Yu.V.Kozachenko, E.Orsingher, L.Beghin, O.Vasylyk, O.Hopkalo.

The properties of sub-Gaussianity and, more generally, φ -sub-Gaussianity, are important features of stochastic processes, since they allow to evaluate different functionals of these processes, and, in particular, the behavior of their suprema. The theory developed for these processes provides us with powerful techniques and tools suitable not only for asymptotic results, but also for deriving many useful bounds for distributions of these processes. The main theory for the spaces of φ -sub-Gaussian random variables and stochastic processes is presented in the classical monograph by V.V. Buldygin and Yu.V. Kozachenko “Metric characterization of random variables and random processes”. This theory has gained numerous further developments in the recent literature. The monograph contains, in particular, the detailed account of sample path properties of φ -sub-Gaussian and more general processes derived via entropy based methods. In the talk we consider sample paths properties of φ -sub-Gaussian processes representing solutions to the heat and higher-order heat-type equations with random initial conditions.