POZVÁNKA na SEMINÁŘ

v úterý 25. března v 13:30
v posluchárně č. 5.068 v budově PřF UPOL, 17. listopadu 12

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Subordination and memory depend kinetics

Abstrakt: Motivated by the paper authored by A.V. Chechkin and I.M. Sokolov entitled "On relation between generalized diffusion and subordination schemes" published in Phys. Rev. E 103, 032133 (2021), we study subordination using methods of classical mathematical analysis. Our primary tool, namely the Efross theorem emerging from the Laplace-Borel convolution, directly leads to integral decomposition whose probabilistic interpretation (if allowed) guides us to subordination which encodes memory effects. Splitting the integral decompositions on the parent and leading processes is ambiguous. However, if the parent process is fixed, its partner leading process appears unique. Commonly assumed parent process given by the Brownian motion is not the only possibility. We illustrate this with the example of the generalized Cattaneo equation, for which we construct two distinct subordinations. For the first of them, the parent process is given by the Gaussian, while for the second one, we get the Cattaneo-Vernotte, that is, the finite speed of propagation. Non-uniqueness in the choice of the parent and leading processes is better visible in the case of standard non-Debye relaxation patterns. For example, the Havriliak-Negami relaxation can be expressed as the subordination either of the Debye model or the Cole-Davidson one.

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