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Pseudo-processes governed by higher-order fractional differential equations. (English)

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Summary: We study here a heat-type differential equation of order \( n \) greater than two, in the case where the time-derivative is supposed to be fractional. The corresponding solution can be described as the transition function of a pseudoprocess \( \Psi_n \) (coinciding with the one governed by the standard, non-fractional, equation) with a time argument \( T_a \) which is itself random. The distribution of \( T_a \) is presented together with some features of the solution (such as analytic expressions for its moments).

MSC:

60G07   General theory of stochastic processes
60E05   Probability distributions: general theory
35K30   Initial value problems for higher-order parabolic equations

Keywords:
higher-order heat-type equations; fractional derivatives; wright functions; stable laws

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