

# APPLICABILITY OF LAPLACE TRANSFORM FOR FRACTIONAL PDE WITH VARIABLE RATE OF DERIVATIVES

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Method of Laplace transform is standard in mathematical physics. One of its adventures is that it is still applicable in the case of PDE with fractional derivatives. But the situation becomes much more complicated if the rate of differentiation can vary with time, even if these variations have very small amplitude. In the paper Theorem is proved which gives the expression for Laplace transform of diffusion equation with time-dependent rate of time derivative. Such equations appear in biology and financial mathematics. It follows that in case of variable fractional derivatives the method of Laplace transform can be used only under certain conditions as approximate method.