Vladikavkaz Scientific Center of the Russian Academy of Sciences

North Caucasus Center for Mathematical Research
of the Vladikavkaz Scientific Center of the RAS

Southern Mathematical Institute
of the Vladikavkaz Scientific Center of the RAS

International Seminar
"Operator Theory, Differential Equations and their Applications"

Seminar Chairmen: Prof. Anatoly G. Kusraev, Prof. Marat A. Pliev
Seminar Secretary: PhD Batradz B. Tasoev

June 14, 4 PM (UTC+3)

Analytical and numerical solution of the nonhomogeneous space-time fractional Fokker-Planck equation with constant and variable coefficients

Mahmoud Elsayed
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We discuss analytical solutions for one- and multi-dimensional nonhomogeneous fractional Fokker-Planck Equation with constant and variable coefficients by the method of separation of variables (Fourier method). Riemann-Liouville and Caputo fractional differential operators are considered to describe fractional derivatives in the temporal and spatial directions, respectively. We analyze and determine eigenfunctions and eigenvalue associated to the boundary value problem for second-order differential equation containing a fractional differentiation operator in the sense of Riemann - Liouville. The numerical solution is based on constructing the implicit finite difference scheme to solve the problem. The convergence and unconditional stability of the proposed scheme are investigated. Finally, the numerical and analytical experiments are given to verify the theoretical analysis.

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The seminar is organized by North Caucasus Center for Mathematical Research of the Vladikavkaz Scientific Center of the RAS jointly with Southern Mathematical Institute of the Vladikavkaz Scientific Center of the RAS.

If you have any questions please don't hesitate to contact the secretary of the seminar Batradz Tasoev at seminar_otde@mail.ru