

Solution of Fractional Diffusion Equation with a Moving Boundary Condition by Variational Iteration Method and Adomian Decomposition Method

Subir Das and Rajeev

Department of Applied Mathematics, Institute of Technology, Banaras Hindu University,
Varanasi -221 005, India

Reprint requests to S. D.; E-mail: subir_das08@hotmail.com

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In this paper, the approximate analytic solutions of the mathematical model of time fractional diffusion equation (FDE) with a moving boundary condition are obtained with the help of variational iteration method (VIM) and Adomian decomposition method (ADM). By using boundary conditions, the explicit solutions of the diffusion front and fractional releases in the dimensionless form have been derived. Both mathematical techniques used to solve the problem perform extremely well in terms of efficiency and simplicity. Numerical solutions of the problem show that only a few iterations are needed to obtain accurate approximate analytical solutions. The results obtained are presented graphically.

Key words: Fractional Diffusion Equation; Moving Boundary Problem; Variational Iteration Method; Adomian Decomposition Method; Caputo Derivative.