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**AN IMPLICIT NUMERICAL METHOD FOR THE SOLUTION OF THE
FRACTIONAL ADVECTION–DIFFUSION EQUATION WITH DELAY**

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A technique for constructing difference schemes for time- and space-fractional partial differential equations with time delay is considered. Shifted Grünwald–Letnikov formulas and the L1-algorithm are used for the approximation of space-fractional and time-fractional derivatives, respectively. We also use piecewise constant interpolation and extrapolation by extending the model prehistory in time. The algorithm is an analog of the pure implicit numerical method and reduces to the solution of linear algebraic systems at each time step. The order of convergence is obtained. Numerical experiments are carried out to support the obtained theoretical results.

Keywords: fractional differential equation, functional delay, grid schemes, interpolation, extrapolation, convergence order.

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