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Numerical Solution of Space Fractional Order Solute Transport System

Authors : Shubham Jaiswal

Abstract : In the present article, a drive is taken to compute the solution of spatial fractional order advection-dispersion equation having source/sink term with given initial and boundary conditions. The equation is converted to a system of ordinary differential equations using second-kind shifted Chebyshev polynomials, which have finally been solved using finite difference method. The striking feature of the article is the fast transportation of solute concentration as and when the system approaches fractional order from standard order for specified values of the parameters of the system.

Keywords : spatial fractional order advection-dispersion equation, second-kind shifted Chebyshev polynomial, collocation method, conservative system, non-conservative system
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