Grünwald Implicit Solution of One-Dimensional Time Fractional Parabolic Equations Using HSKSOR Iteration

ABSTRACT

This paper presents the application of a half-sweep iteration concept to the Grünwald implicit difference schemes with the Kaudd Successive Over-Relaxation (KSOR) iterative method in solving one-dimensional linear time-fractional parabolic equations. The formulation and implementation of the proposed methods are discussed. In order to validate the performance of HSKSOR, comparisons are made with another two iterative methods, fullsweep KSOR (FSKSOR) and Gauss-Seidel (FSGS) iterative methods. Based on the numerical results of three tested examples, it shows that the HSKSOR is superior compared to FSKSOR and FSGS iterative methods.