Implementation of the half-sweep AOR iterative algorithm for spacefractional diffusion equations

Abstract

In this paper, we consider the numerical solution of one dimensional space-fractional diffusion equation. The half-sweep AOR (HSAOR) iterative method is applied to solve linear system generated from discretization of one dimensional space-fractional diffusion equation using Caputo's derivative operator and half-sweep implicit finite difference scheme. Furthermore, the formulation and implementation of HSAOR iterative method to solve the problem are also presented. Two examples and comparisons with FSAOR iterative method are given to show the effectiveness of the proposed method. From numerical results obtained, it has shown that the HSAOR iterative method is superior as compared with the FSAOR methods.