

Solving space-fractional diffusion equations by using HSSOR method

ABSTRACT

The purpose of this study is to apply half-sweep iteration concept with SOR iterative method namely half-sweep SOR (HSSOR) method in solving space-fractional diffusion equations. The Caputo's derivative operators and implicit discretization scheme based on finite difference (FD) approach will be used to approximate linear space-fractional diffusion equations for constructing system of linear equations. Two numerical tests were carried out to show the effectiveness of the proposed method. Then, the results indicated that the HSSOR iterative method has less number of iterations (K) and computational time (time) as compared with FSSOR method. However in term of the maximum error analysis, HSSOR method is comparable with FSSOR method. Finally, it can be pointed out that the HSSOR is superior to FSSOR iterative method.