## Performance of FSPAOR iteration for solving one-dimensional space-fractional diffusion equation

## ABSTRACT

This paper considers the numerical solution of a one-dimensional space-fractional diffusion equation. To obtain the solution, we use an unconditionally stable implicit finite difference approximation with the Caputo's space-fractional operator. We study on improving the convergence rate of the solution while solving the generated linear system through the approximation equation iteratively. In our study, we apply the preconditioning technique to construct a preconditioned linear system which eventually derives into a Full-Sweep Preconditioned AOR. From the presented results, we show that the proposed Full-Sweep Preconditioned AOR iterative method has superiority in efficiency compared to the basic FullSweep Preconditioned SOR and Full-Sweep Preconditioned Gauss-Seidel iterative methods.