Application of half-sweep sor iteration with nonlocal arithmetic discretization scheme for solving Burger's equation

ABSTRACT

In this paper, the Burger's equations have been approximated by using the second-order finite difference scheme and the half-sweep nonlocal arithmetic discretization scheme to construct the half-sweep generated linear system. Then, we investigate the applicable formulation of Half-sweep SuccessiveOver Relaxation (HSSOR) iterative method for solving this linear system. In order to verify the effectiveness of the HSSOR iterative method, this paper also included the Fullsweep Successive OverRelaxation (FSSOR) and Full-Sweep Gauss-Seidel (FSGS) iterative methods. The performance analysis of these three proposed iterative methods is illustrated by solving four proposed Burger's problems. The numerical results illustrate the great performance of the HSSOR iterative method together with half-sweep nonlocal arithmetic discretization scheme to solve the Burger's equations in senses of execution time and number of iterations.