

Quarter-sweep modified SOR iterative algorithm and cubic spline basis for the solution of second order two-point boundary value problems

Abstract

The aim of this study is to describe the formulation of Quarter-Sweep Modified Successive Over-Relaxation (QSMSOR) iterative method using cubic polynomial spline scheme for solving second order two-point linear boundary value problems. To solve the problems, a linear system will be constructed via discretization process by using cubic spline approximation equation. Then the generated linear system has been solved using the proposed QSMSOR iterative method to show the superiority over Full-Sweep Modified Successive Over-Relaxation (FSMSOR) and Half-Sweep Modified Successive Over-Relaxation (HSMSOR) methods. Computational results are provided to illustrate the effectiveness of the proposed method.