Numerical solution of helmholtz equation using a new four point EGMSOR iterative method.

abstract

Recently, a family of block iterative method via Explicit Group (EG) iterative methods is shown to be one of the feasible and successful classes of iterative methods in solving any system of linear algebraic equations. The aim of this article is to examine the effectiveness of the new four Point-EGMSOR iterative methods in solving two-dimensional Helmholtz equations. The concept of a four Point-EGMSOR is inspired via combination between four Point-EG iterative method together with Modified Successive OverRelaxation (MSOR) approach, namely four Point-EGMSOR. In addition, the formulation and implementation of the proposed method are also presented. Some numerical experiments have been carried out to show the effectiveness of the proposed method compared to the standard method.

Keyword: PDEs; Explicit group; Finite difference method; Helmholtz equation; Modified Successive OverRelaxation (MSOR) method.