

Complexity Reduction Approach for Solving Second Kind of Fredholm Integral Equations

ABSTRACT

Initially, the concept of the complexity reduction approach was applied to solve symmetry algebraic systems that were generated from the discretization of the partial differential equations. Consequently, in this paper, the effectiveness of a complexity reduction approach based on half- and quarter-sweep iteration concepts for solving linear Fredholm integral equations of the second kind is investigated. Half- and quarter-sweep iterative methods are applied to solve dense linear systems generated from the discretization of the second kind of linear Fredholm integral equations using a repeated modified trapezoidal (RMT) scheme. The formulation and implementation of the proposed methods are presented. In addition, computational complexity analysis and numerical results of test examples are also included to verify the performance of the proposed methods.