Half-sweep quadrature-difference schemes with iterative method in solving linear Fredholm integro-differential equations

Abstract

In this paper, half-sweep iteration concept applied on quadrature-difference schemes with Gauss-Seidel (GS) iterative method in solving linear Fredholm integro-differential equations. The combinations of discretization schemes of repeated trapezoidal and Simpson's 1/3 with central difference schemes are analyzed. The formulation and the implementation of the proposed methods are explained in detail. In addition, several numerical experiments and computational complexity analysis were also carried out to validate the presentation of the schemes and methods. The findings show that, the HSGS iteration method is superior to the standard GS method. As well the high order quadrature scheme produced more accurate approximation solution compared to combination of repeated trapezoidal-central difference schemes.