

Comparison of closed repeated newton-cotes quadrature schemes with half-sweep iteration concept in solving linear fredholm integro-differential equations

Abstract

The purpose of this paper is to apply half-sweep iteration concept with Gauss-Seidel (GS) iterative method namely Half-Sweep Gauss-Seidel (HSGS) method for solving high order closed repeated Newton-Cotes (CRNC) quadrature approximation equations associated with numerical solution of linear Fredholm integro-differential equations. Two different order of CRNC i.e. repeated Simpson's 3/1 and repeated Simpson's 8/3 schemes are considered in this research work. The formulation the implementation the proposed methods are explained. In addition, several numerical simulations and computational complexity analysis were carried out to authenticate the performance of the methods. The findings show that the HSGS iteration method is superior to the standard GS method. As well the high order CRNC quadrature schemes produced more precise approximation solution compared to repeated trapezoidal scheme.