Examination of half-sweep closed newton–cotes quadrature schemes in solving dense system

ABSTRACT

The main objective of this research is to apply and analyse the performance of the half-sweep iteration concept to the low order to high order Newton–Cotes and finite difference schemes via the Fredholm integro-differential equations to form a system of linear equations. Then generated linear systems will be computed by half-sweep Conjugate Gradient Normal Equation (HSCGNR) iterative method. The fundamental designs and formulations of full- and half-sweep Newton–Cotes and finite difference schemes in combined with the full- and half-sweep Conjugate Gradient Normal Equations methods are also presented. Analysis of the computational complexity and reduction in computational amount are also included to show that the combination of the HSCGNR iterative method with high order discretisation schemes is superior compared with other low order schemes with full-sweep or standard Conjugate Gradient Normal Equation method via some examples.