

# **Linear rational finite difference solution for solving first-order fredholm integro-differential equations**

## **ABSTRACT**

In this paper, we deal with the application of the linear rational finite difference (LRFD) method together with the first-order quadrature scheme to derive the first-order quadrature-rational finite difference approximation equation for first-order linear Fredholm integro-differential equations (FIDE). Derivation of this approximation equation, the linear system can be generated in which its coefficient matrix is large and dense. To make a comparison, the classical finite difference method (FD) based on the second-order central difference scheme is also presented. In numerical experiments, the maximum values of absolute errors of the numerical solutions obtained by both methods have been compared. Therefore, it can be concluded that the accuracy of numerical solutions for the quadrature-LRFD gives more accurate than the quadrature-FD method.