
Summary: In this study, a spectral collocation matrix method has been introduced to solve the linear Fredholm integro-differential-difference equation (LFIDDE) numerically. The method is combined Chebyshev series and matrix algebras. As it is assumed that the truncated second-kind Chebyshev series is a solution of the given LFIDDEs, the matrix form of the each part of LFIDDEs is put into the LFIDDEs which is transformed a matrix-vector equation. The coefficients of the truncated second-kind Chebyshev series are obtained to solving such a linear equation. The given method’s quality and reliability are shown in some numerical examples and comparisons of some methods.

MSC:
45A05  Linear integral equations
65R20  Numerical methods for integral equations
41A10  Approximation by polynomials

Keywords:
differential-difference equation; collocation matrix method; spectral method; Chebyshev polynomials

Full Text: DOI