

NUMERICAL SOLUTION OF THIRD KIND VOLTERRA INTEGRAL EQUATIONS BY THE TAU METHOD

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Abstract

This talk is concerned with the numerical solution of Volterra integral equations of the third kind with non-smooth solutions based on the recursive approach of the spectral Tau method. To this end, a new set of the fractional version of canonical basis polynomials (called FC-polynomials) is introduced. The approximate polynomial solution (called Tau-solution) is expressed in terms of FC-polynomials. The fractional structure of Tau-solution allows recovering the standard degree of accuracy of spectral methods even in the case of non-smooth solutions. The convergence analysis of the method is carried out. The obtained numerical results show the accuracy and efficiency of the method compared to other existing methods.

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