

Accepted Manuscript

Numerical solution of integro-differential equations of high order by wavelet basis, its algorithm and convergence analysis

A. Babaaghaie, K. Maleknejad

PII: S0377-0427(17)30206-6

DOI: <http://dx.doi.org/10.1016/j.cam.2017.04.035>

Reference: CAM 11115

To appear in: *Journal of Computational and Applied Mathematics*

Received date: 13 February 2017



Please cite this article as: A. Babaaghaie, K. Maleknejad, Numerical solution of integro-differential equations of high order by wavelet basis, its algorithm and convergence analysis, *Journal of Computational and Applied Mathematics* (2017), <http://dx.doi.org/10.1016/j.cam.2017.04.035>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Numerical solution of integro-differential equations of high order by wavelet basis, its algorithm and convergence analysis

A.Babaaghaie ¹, K. Maleknejad ^{*2}

*Department of mathematics, karaj Branch Islamic azad University, Karaj, Iran.
E-mails: a.babaaghaie@gmail.com, maleknejad@iust.ac.ir.*

Abstract

This paper presents, for the first time, numerical solutions for this particular type of integro-differential equations. According to equations which will be introduced, suitable wavelet Galerkin method is provided using wavelet basis in the space $C^\alpha(R) \cap L^2(R)$, $\alpha > 0$, that $C^\alpha(R)$ is the Hölder space of exponent α . This approach has two advantages. First, the wavelets basis are arbitrary. It means that any differentiable wavelets basis can be used. Second, the desired orders for this equation are the reasons for involving a wide variety of this types of equations. The Algorithm and convergence analysis of this scheme are described. Numerical examples, plots and tablets of errors confirm the applicability and the validity of the proposed method.

Keywords: Fredholm integro-differential equation; wavelet Galerkin method; wavelets basis; convergence analysis.

2010 MSC: 65R20; 65G99; 65N30; 47A58.

^{*2}: Corresponding author. Tel: +98 21 732 254 16; fax: +98 21 730 216 62.
Email address: maleknejad@iust.ac.ir (A.Babaaghaie ¹, K. Maleknejad ^{*2})
¹Email address: a.babaaghaie@gmail.com.

Download English Version:

<https://daneshyari.com/en/article/5776092>

Download Persian Version:

<https://daneshyari.com/article/5776092>

[Daneshyari.com](https://daneshyari.com)