

# Wavelet Collocation Methods for Solving Neutral Delay Differential Equations

Mo Faheem<sup>1</sup>, Akmal Raza<sup>1</sup>, and Arshad Khan<sup>2</sup>

<sup>1</sup>Jamia Millia Islamia Central University

<sup>2</sup>Jamia Millia Islamia

May 5, 2020

## Abstract

In this paper we proposed wavelet based collocation methods for solving neutral delay differential equations. We use Legendre wavelet, Hermite wavelet, Chebyshev wavelet and Laguerre wavelet to solve the neutral delay differential equations numerically. We solve five linear and one nonlinear problem to demonstrate the accuracy of wavelet series solution. Wavelet series solution converges fast and gives more accurate results in comparison to other methods present in literature. We compare our results with Runge-Kutta-type methods by Wang et al. [1] and one-leg  $\vartheta$  methods by Wang et al. [2] and observe that our results are more accurate.

## Hosted file

paper1a.pdf available at <https://authorea.com/users/304984/articles/435560-wavelet-collocation-methods-for-solving-neutral-delay-differential-equations>



























