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Entitled

NUMERICAL AND THEORETICAL INVESTIGATIONS OF FRACTIONAL DIFFERENTIAL EQUATIONS

by

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Date & Venue

2:00 pm

Monday, 18/04/2022

Link: <https://eu.bbcollab.com/guest/5eaccac8674341d29b1eb94f1a02947f>

Abstract

Fractional calculus has been recently received huge attention from Mathematicians and engineers due to its importance in many real-life applications such as: fluid mechanics, electromagnetic, acoustics, chemistry, biology, physics and material sciences. In this thesis, we present numerical algorithms for solving fractional IVPs and system of fractional IVPs where two types of fractional derivatives are used: Caputo-Fabrizio, and Atangana-Baleanu-Caputo derivatives. These algorithms are developed based on modified Adams-Bashforth method. In addition, we discuss the theoretical solution of special class of fractional IVPs. Several examples are discussed to illustrate the efficiency and accuracy of the present schemes.

Keywords: Fractional initial value problems; fractional system of initial value problems; Caputo-Fabrizio derivative; Atangana-Baleanu-Caputo derivative.