A NOVEL APPROACH FOR SOLVING FRACTIONAL BAGLEY-TORVIK EQUATIONS

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Abstract: In this paper, we obtained the solution of Bagley-Torvik equations which belongs to a class of fractional ordinary differential equation by the use of Elzaki transformation method. Here the fractional derivatives are defined in Caputo sense. Graphically comparison of the obtained solution by proposed method with the existing methods is also discussed.

Keywords and Phrases: Fractional Bagley-Torvik equation, Elzaki transformation, Caputo fractional derivative.

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1. Introduction

Over the last decades, researchers have been investigated many fractional differential equations, which is used in numerous fields. Due to so much useful, much research has been done in this field. Several phenomenons in natural science and engineering are written in the form of fractional differential equations. Fractional differential equations have been used within many Mathematical models, for more detail; see [10, 11, 22, 28]. Various important researches on fractional calculus has been deliberated in the past years and a lot of books have been written by various authors, see [1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 17, 19, 24, 26]. In the literature of fractional differentiations and integrations there are several integral transforms like Laplace, Fourier, Mellin, Sumudu to name but a few. A new integral transform namely Elzaki transform [13] which is a modified form of classical Laplace and Sumudu