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INSPEM'S ONLINE WEEKLY SEMINAR

DATE : 28 JANUARY 2022 (FRIDAY)
TIME : 3.15 PM

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PROF. DR. M. ALI AKBAR

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Topic :
Different Definitions of Fractional Derivatives, Their Flaws and Research on Fractional Differential Equations

Abstract

The idea of fractional derivative was introduced in 1695. In calculus, the rate of change of quantities is studied. The main focus of differential calculus is the derivative of functions and their applications. This concept is used in all branches of science and engineering for modeling. However, due to the complexity of the real-life problems in many cases, such as ground water flow, anomalous diffusion phenomena, manufacturing problems, etc., when comparing these models with experimental data, it is observed a significant difference between experimental data and the results obtained from these mathematical models. In this case, the results obtained from the fractional-order model agree nicely with the experimental data. Therefore, in this study, we will investigate analytical solutions to the fractional-order nonlinear Tzitzeica-Dodd-Bullough (FNLTDB) equation through putting in use the improved Bernoulli sub-equation function (IBSEF) method. Before that, we will briefly discuss why different definitions of fractional derivatives have been given in the literature.

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