

BETA-DERIVATIVE, ITS PROPERTIES AND SOLUTIONS OF FRACTIONAL DIFFERENTIAL EQUATIONS CONCERNING BETA-DERIVATIVES

PROFESSOR M. ALI AKBAR
UNIVERSITY OF RAJSHAHI, BANGLADESH



Background. Prof. M. Ali Akbar is a Professor at the Department of Applied Mathematics, University of Rajshahi, Bangladesh. In 2005, he received his PhD degree from the same university. He attended the School of Mathematical Sciences at Universiti Sains Malaysia in 2012 and completed a one-year post-doc. He has visited USM six times as a visiting researcher. Prof. Ali has published over 250 research articles in peer-reviewed international journals, with 145 of them being Scopus/Web of Science indexed. His total Impact Factor is over 286, according to the JCR assessment released in July 2021. He has supervised 10 PhD students, 4 M. Phil students, 15 M.Sc. students, and 2 BSc (Hons) students. He is an editorial board member of more than 10 journals. He also serves as a reviewer for more than 75 prestigious journals. He has been honoured by many academic and merit awards. He has expertise in Fractional Calculus, Mathematical Physics, Exact Solutions of Nonlinear ODEs and PDEs.

Abstract. There are different types of fractional derivatives in literature, such as Riemann-Liouville fractional derivative, Caputo derivative, conformable fractional derivative, beta derivative, etc. The first three of these definitions do not satisfy some of the fundamental properties of calculus. Consequently, Atangana and Baleanu introduced the definition of the beta derivative. In this study, we will first show that the beta derivative satisfies all characteristics of classical calculus. And later, we will interpret how to determine the analytical solutions to fractional differential equations with beta derivatives using the sine-Gordon expansion approach.

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Link: <https://bit.ly/2ZdxQu0> (Via Webex)

