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VARIATIONAL ITERATION METHOD FOR FRACTIONAL PARTIAL DIFFERENTIAL EQUATIONS - A UNIVERSAL APPROACH BY SUMUDU TRANSFORM

N. B. Manjare and H. T. Dinde

Department of Mathematics,
Shivaji University,
Kolhapur - 416004, Maharashtra, INDIA

E-mail : nageshmanjare@gmail.com, drhtdmaths@gmail.com

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Abstract: The important feature of this research paper is an extension to solve linear and nonlinear applications of fractional partial differential equations suggested by D. Ziane and M. H. Cherif for various values of α $(1 < \alpha \leq 2)$. The contemplated graphs show that the behavior of exact and approximate solution for different values of fractional order α. The effectiveness and convenience of the method is tested with the help of two illustrative examples. The fractional derivative is described in the Liouville-Caputo sense.

Keywords and Phrases: Fractional Calculus, Sumudu transform, Variational iteration method, Convergence of Variational iteration method, Linear and Nonlinear partial differential equations.

2020 Mathematics Subject Classification: 26A33, 65R10, 65M12, 35R11.

1. Introduction

In 2006, A. A. Kilbas et al. [14] published new book which is completely dedicated on theory and applications of fractional differential equations. In their innovation, they complemented on the concept of fractional differential equations through various books and journals. They suggested many new results on the theory of ordinary and partial differential equations. In systematic manner, they presented various results including the existence and uniqueness of solutions for the