MATH COLLOQUIUM SERIES

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EXTENDED CUBIC B-SPLINE APPROXIMATION FOR SOLVING THE GENERALIZED NONLINEAR TIME-FRACTIONAL KLEIN-GORDON EQUATION

A B-spline function is a series of flexible tools that are managed by a set of control points to produce smooth curves. By using a variety of points, these functions make it possible to build and maintain complicated shapes. Any spline function of a certain degree can be expressed as a linear combination of the B-spline basis of that degree. The aim of this talk is to use extended cubic B-spline (ECBS) functions for the numerical solutions of the generalized nonlinear time-fractional Klein-Gordon equation (TFKGE). Initially, the Caputo time-fractional derivative (CTFD) is approximated using the standard finite difference technique, and the space derivatives have been discretized by utilizing ECBS functions. The stability and convergence analysis have also been discussed for the given numerical scheme. The presented technique is tested on a variety of problems and the approximate results are compared with the existing computational schemes.

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Thursday, 15 June 2023
9:00 – 10:00 am (Malaysia)
https://bit.ly/MCS15-06-2023

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