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Collocation method for a class of partial integro-differential equations using UAT B-splines

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Abstract

In this paper, a new numerical method for solving a class of partial integro differential equations with weakly singular kernels is presented. It is based on Uniform Algebraic Trigonometric (UAT) tension B-spline collocation. The method uses a backward Euler scheme in time and UAT tension B-spline to approximate the spatial dependency of the solution. Convergence and stability are discussed. The accuracy and efficiency of the method are demonstrated by numerical examples from the literature. Numerical results illustrate that the proposed method surpasses several previously established techniques.

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