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Summary: In this paper, Coupled Fractional Reduced Differential Transform method is extended to apply to the generalized time-fractional two-component evolutionary system of order 2. By using this method, the solutions in the form of a generalized Taylor series are obtained. The graphics of numerical solutions together with the error analysis demonstrate that the present method is effective and accurate for obtaining approximate solutions of fractional coupled equations. Moreover, the results also indicate that the solutions obtained by residual power series method in previous literature [M. Alquran, J. Appl. Anal. Comput. 5, No. 4, 589–599 (2015; Zbl 1447.35111)] contain errors.

MSC:
35G55 Initial value problems for systems of nonlinear higher-order PDEs
26A33 Fractional derivatives and integrals
35R11 Fractional partial differential equations
35C10 Series solutions to PDEs

Keywords:
coupled fractional reduced differential transform; generalized Taylor series; residual power series method; time-fractional two-component evolutionary system of order 2

Full Text: DOI

References:
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