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Numerical solutions and conservation laws of the time fractional coupled WBK-type system.
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Summary: In this article, the general form of the fractional reduced differential transform method (FRDTM) to the \((N+1)\)-dimensional cases was presented. Then, we applied the general FRDTM to handle the time fractional couple Whitham-Broer-Kaup’s (WBK)-type system. As a result, the numerical solution of this considered model was found. Next, based on the concepts of the nonlinear self-adjointness and Noether operators, conservation laws for the time fractional coupled WBK-type system was yielded. The results of the above obtained can help us better understand physics phenomena arising in describing propagation of shallow water waves.

MSC:

35A35 Theoretical approximation in context of PDEs
35A22 Transform methods (e.g., integral transforms) applied to PDEs
22E70 Applications of Lie groups to the sciences; explicit representations
35B06 Symmetries, invariants, etc. in context of PDEs
35R11 Fractional partial differential equations

Keywords:
conservation laws; \((N+1)\)-dimensional FRDTM; numerical solutions; time fractional coupled WBK-type system

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