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Symmetry properties, conservation laws, reduction and numerical approximations of time-fractional cylindrical-Burgers equation. (English) [Zbl 07263878](#)
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Summary: In this paper the Lie group analysis of the time-fractional cylindrical Burgers equation (time-FCB), which is a fundamental PDE occurring in various areas of applied mathematics, such as fluid mechanics, non-linear acoustics, gas dynamics, traffic flow and etc. is given. For this purpose the Riemann-Liouville derivative is used to implement the Lie algorithm for finding the symmetry operators. A reduced form of the equation is given by using the similarity variables obtained from a symmetry and Erdelyi-Kober operator. In the next step conservation laws are derived via a generalization of Noether's theorem. Finally the Chebyshev wavelets for time-fractional differential equations (FDEs) is applied for solving the considered equation.

MSC:

00 General and overarching topics; collections

Keywords:

[symmetry analysis](#); [fractional derivatives](#); [Chebyshev wavelets](#); [fractional conservation laws](#); [Noether's theorem](#)

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