

Conservation Laws and Exact Series Solution of Fractional-Order Hirota-Satsoma Coupled KdV system by Symmetry Analysis

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Abstract

In this work, we investigated the invariance analysis of fractional-order Hirota-Satsoma coupled Korteweg-de Vries (HSC-KdV) system of equations based on Riemann-Liouville (RL) derivatives. The Lie Symmetry analysis is considered to obtain infinitesimal generators; we reduced the system of coupled equations into nonlinear fractional ordinary differential equations (FODEs) with the help of Erdelyi's-Kober (EK) fractional differential and integral operators. The reduced system of FODEs solved by means of the power series technique with its convergence. The conservation laws of the system constructed by Noether's theorem.

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