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Numerical solution of a coupled Korteweg-de Vries equations by collocation method

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Abstract

A numerical method for solving the coupled Korteweg-de Vries (CKdV) equation based on the collocation method with quintic B-spline finite elements is set up to simulate the solution of CKdV equation. Invariants and error norms are studied wherever possible to determine the conservation properties of the algorithm. Simulation of single soliton, interaction of two solitons, and birth of solitons are presented. A linear stability analysis shows the scheme to be unconditionally stable. © 2008 Wiley Periodicals, Inc.

Author Keywords

Birth of solitons; CKdV equation; Collocation method; Quintic B-splines; Soliton interaction

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