

Kumar, Kotapally Harish; Jiwari, Ram

A note on numerical solution of classical Darboux problem. (English) Zbl 1478.65097
Math. Methods Appl. Sci. 44, No. 17, 12998-13007 (2021).

Summary: Recently, many authors studied the numerical solution of the classical Darboux problem in its integral form via two-dimensional nonlinear Volterra-Fredholm integral equation. In the present article, a numerical technique based on the Chebyshev wavelet is proposed to solve the Darboux problem directly without converting into a nonlinear Volterra-Fredholm integral equation. The proposed technique is different from the techniques discussed in the literature. The proposed approach produces higher accuracy than its counterpart techniques. The proposed scheme is illustrated with suitable examples to show the advantages in terms of its accuracy with a lesser grid size.

MSC:

- 65M70 Spectral, collocation and related methods for initial value and initial-boundary value problems involving PDEs
- 65T60 Numerical methods for wavelets
- 41A50 Best approximation, Chebyshev systems
- 35L10 Second-order hyperbolic equations
- 35Q05 Euler-Poisson-Darboux equations

Keywords:

Chebyshev wavelet; collocation method; Darboux problem; hyperbolic partial differential equation

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