عنوان مقاله:

An improvised technique of quintic hermite splines to discretize generalized Burgers–Huxley type equations

محل انتشار:

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خلاصه مقاله:

A mathematical collocation solution for generalized Burgers–Huxley and generalized Burgers–Fisher equations has been monitored using the weighted residual method with Hermite splines. In the space direction, quintic Hermite splines are introduced, while the time direction is dis-cretized using a finite difference approach. The technique is determined to be unconditionally stable, with order (h۴ + $\triangle$t) convergence. The tech-nique's efficacy is tested using nonlinear partial differential equations. Two problems of the generalized Burgers–Huxley and Burgers–Fisher equations have been solved using a finite difference scheme as well as the quin-tic Hermite collocation method (FDQHCM) with varying impacts. The FDQHCM computer codes are written in MATLAB without transforming the nonlinear term to a linear term. The numerical findings are reported in weighted norms and in discrete form. To assess the technique's appli-cability, numerical and exact values are compared, and a reasonably good agreement is recognized between the two.

کلمات کلیدی:

Quintic Hermite splines, Forward finite difference scheme, col-location method, Stability analysis

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