

Homotopy Perturbation Method for Solving Nonlinear Differential-Difference Equations

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In this paper, the homotopy perturbation method (HPM) is extended to obtain analytical solutions for some nonlinear differential-difference equations (NDDEs). The discretized modified Korteweg-de Vries (mKdV) lattice equation and the discretized nonlinear Schrödinger equation are taken as examples to illustrate the validity and the great potential of the HPM in solving such NDDEs. Comparisons between the results of the presented method and exact solutions are made. The results reveal that the HPM is very effective and convenient for solving such kind of equations.

Key words: Homotopy Perturbation Method; Nonlinear Differential-Difference Equation; Discretized mKdV Lattice Equation; Discretized Nonlinear Schrödinger Equation.