On the Homotopy Perturbation Method for the Exact Solution of Fitzhugh–Nagumo Equation, pp. 32-43

S. Salman Nourazar1
Mohsen Soori1
Akbar Nazari-Golshan2
Title:

On the Homotopy Perturbation Method for the Exact Solution of Fitzhugh–Nagumo Equation, pp. 32-43

By:

S. Salman Nourazar1, Mohsen Soori1, Akbar Nazari-Golshan2

1 Department of Mechanical Engineering, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran
2 Department of Physics, Amirkabir University of Technology (Tehran Polytechnic), Tehran, Iran

Abstract: In this paper, the Homotopy Perturbation Method (HPM) is used to solve the Fitzhugh–Nagumo non-linear differential equations. In order to obtain the exact solution of Fitzhugh–Nagumo equation, two case study problems of the equation are solved by using the HPM. The trend of the rapid convergence of the sequences constructed by the method towards the exact solution is also numerically shown. As a result, the rapid convergence towards the exact solutions of HPM indicates that the method is powerful and efficient technique to solve the Fitzhugh–Nagumo non-linear differential equations. Also, the results present validity and great potential of the method as a powerful algorithm in order to obtain the exact solution of nonlinear differential equations.

Keyword: Fitzhugh–Nagumo equation, Homotopy Perturbation Method, Nonlinear Differential Equations

References


