

New Travelling Wave Solutions of Burgers Equation with Finite Transport Memory

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The nonlinear evolution equations with finite memory have a wide range of applications in science and engineering. The Burgers equation with finite memory transport (time-delayed) describes convection-diffusion processes. In this paper, we establish the new solitary wave solutions for the time-delayed Burgers equation. The extended tanh method and the exp-function method have been employed to reveal these new solutions. Further, we have calculated the numerical solutions of the time-delayed Burgers equation with initial conditions by using the homotopy perturbation method (HPM). Our results show that the extended tanh and exp-function methods are very effective in finding exact solutions of the considered problem and HPM is very powerful in finding numerical solutions with good accuracy for nonlinear partial differential equations without any need of transformation or perturbation.

Key words: Travelling Wave Solutions; Time-Delayed Burgers Equation; Tanh-Function Method; Exp-Function Method; Burgers-Fisher Equation; Homotopy Perturbation Method.

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