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SEMI-ANALYTICAL APPROACH TO SOLVE NON-LINEAR DIFFERENTIAL EQUATIONS AND THEIR GRAPHICAL REPRESENTATIONS

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ABSTRACT

In this paper we have applied a new approximation technique to solve non-linear partial differential equation. The approximation technique is called Homotopy perturbation method (HPM). The main difference between traditional perturbation method and this one is that it can be applied for even higher values of the parameter, where as traditional perturbation method can be applied only for lower values of parameter. It means that when the value of the parameter is less than one only then the traditional perturbation can be applied. In this paper we have considered a highly non-linear partial differential equation and found the approximate solution using HPM for two types of initial conditions. Then we have drawn two-dimensional and three dimensional graphs from the solution of the equations which demonstrates the physical situation of the solution for different values of the parameter. This gives us the clear picture of the range of the variables for which the normal solution exists and for what values of the variable the chaotic situation arises.

KEYWORDS: Approximation Solution, Chaotic Solution, Homotopy, Homotopy Perturbation, Perturbation