Homotopy Perturbation Method for Higher Dimensional Nonlinear Evolutionary Equations

Emanullah Hızel^a and Semih Küçükarslan^b

^a Department of Mathematics, İstanbul Technical University, İstanbul, Turkey ^b Department of Engineering Sciences, İstanbul Technical University, İstanbul, Turkey

Reprint requests to S. K.; Fax: +90-212-285 6386; E-mail: kucukarslan@itu.edu.tr

Z. Naturforsch. 64a, 568-574 (2009); received September 22, 2008 / revised December 2, 2008

In this paper, an iterative numerical solution of the higher-dimensional (3+1) physically important nonlinear evolutionary equations is studied by using the homotopy perturbation method (HPM). For this purpose, the Kadomstev-Petviashvili (KP) and the Jumbo-Miwa (JM) equations are analyzed with the HPM and the available exact solutions obtained by the homogenous balance method will be compared to show the accuracy of the proposed numerical algorithm. The results approves the effectiveness and accuracy of the HPM.

Key words: Homotopy Perturbation Method (HPM); Kadomstev-Petviashvili (KP) Equation; Jumbo-Miwa (JM) Equation.