Application of the Homotopy Analysis Method for Solving Equal-Width Wave and Modified Equal-Width Wave Equations

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Although the homotopy analysis method (HAM) is, by now, a well-known analytic method for handling functional equations, there is no general proof of its applicability to all kinds of equations. In this paper, by using this method to solve equal-width wave (EW) and modified equal-width wave (MEW) equations, we have made a new contribution to this field of research. Our goal is to emphasize on two points: one is the efficiency of HAM in handling these important family of equations and its superiority over other analytic methods like homotopy perturbation method (HPM), variational iteration method (VIM), and Adomian decomposition method (ADM). The other point is that although the considered two equations have different nonlinear terms, we have used the same auxiliary elements to solve them.