

The Improved Laplace Homotopy Perturbation Method for Solving Non-integrable PDEs

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Abstract : The Laplace homotopy perturbation method (LHPM) is an approximate method that help to compute the approximate solution for partial differential equations. The method has been used for solving several problems in science. It requires the initial condition, so it solves the initial value problem. In physics, when some important terms are taken in account, we may obtain non-integrable partial differential equations that do not have analytical integrals. This type of PDEs do not have exact solution, therefore, we need to compute the solution without initial condition. In this work, we improved the LHPM to be able to solve non-integrable problem, especially the damped PDEs, which are the PDEs that include a damping term which makes the PDEs non-integrable. We improved the LHPM by setting a perturbation parameter and an embedding parameter as the damping parameter and using the initial condition for damped PDE as the initial condition for non-damped PDE.

Keywords : non-integrable PDEs, modified Kawahara equation;, laplace homotopy perturbation method, damping term

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