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# COMBINED LAPLACE TRANSFORM WITH ANALYTICAL METHODS FOR SOLVING VOLTERRA INTEGRAL EQUATIONS WITH A CONVOLUTION KERNEL

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## Abstract

In this article, a homotopy perturbation transform method (HPTM) and the Laplace transform combined with Taylor expansion method are presented for solving Volterra integral equations with a convolution kernel. The (HPTM) is innovative in Laplace transform algorithm and makes the calculation much simpler while in the Laplace transform and Taylor expansion method we first convert the integral equation to an algebraic equation using Laplace transform then we find its numerical inversion by power series. The numerical solution obtained by the proposed methods indicate that the approaches are easy computationally and its implementation very attractive. The methods are described and numerical examples are given to illustrate its accuracy and stability.

## Keywords

Taylor expansion; Laplace transform; Volterra integral equations; Homotopy perturbation transform method

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