LAPLACE TRANSFORM AND ADOMIAN DECOMPOSITION METHODS
FOR SOLVING
NONLINEAR VOLterra INTEGRO-DIFFERENTIAL EQUATIONS

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Specially dedicated to my beloved family
and those people who have given consistent support and guide me
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ABSTRACT

Since its introduction in the 1980s, the Adomian Decomposition Method (ADM) has proven to be an efficient and reliable method for solving many types of problems. Originally developed to solve nonlinear functional equations, the ADM has since been used for a wide range of equation types (like boundary value problems, integral equations, equations arising in flow of incompressible and compressible fluids etc...). This work is devoted to an evaluation of the effectiveness of this method when used for solve nonlinear Volterra integro-differential equations and also the combined form of the Laplace transform method with the Adomian decomposition method is effectively and useful way to develop an analytic treatment for many types of equations, linear and nonlinear ordinary differential equations (ODE), linear and nonlinear partial differential equations (PDE). In this study will combined Laplace transform-Adomian decomposition method to solve nonlinear Volterra integro-differential equations, this study is divided into five Chapters. The first chapter is devoted to an introduction, the second is devoted to the literature review, and Chapter 3 devoted to research methodology, Chapter 4 presents the solution for the nonlinear Volterra integro-differential equation. Finally, the Chapter 5 is devoted to the conclusion and recommendations based on this study.
ABSTRAK

Sejak diperkenalkan pada tahun 1980-an, Kaedah penguraian Adomian (ADM) telah terbukti menjadi kaedah yang cekap dan berkesan untuk menyelesaikan pelbagai jenis masalah. Asalnya dibangunkan untuk menyelesaikan persamaan fungsi linear, yang ADM sejak itu telah digunakan untuk pelbagai jenis persamaan (seperti masalah sempadan nilai, persamaan kamiran, persamaan yang timbul dalam aliran tak boleh mampat dan cecair mampat dan lain-lain ...). Kerja ini menumpukan kepada penilaian terhadap keberkesanan kaedah ini apabila diguna untuk menyelesaikan persamaan linear Volterra integro-berbeza, dan juga bentuk gabungan kaedah penjelmaan Laplace dengan kaedah penguraian Adomian adalah berkesan dan berguna cara untuk membangunkan satu rawatan analisis untuk pelbagai jenis Persamaan terbitan biasa (PTB) linear dan tak linear, Persamaan terbitan separa (PTS) linear dan tak linear. Dalam kajian ini akan digabungkan Laplace-Adomian kaedah penguraian untuk menyelesaikan persamaan linear Volterra integro-berbeza, kajian ini dibahagikan kepada lima bab. Bab pertama dikhaskan untuk pengenalan, Kedua dikhaskan untuk kajian literatur, dan Bab 3 ditumpukan kepada kaedah penyelidikan, Bab 4 membentangkan penyelesaian untuk Volterra persamaan integro-pembezaan linear. Akhirnya, Bab 5 dikhaskan untuk kesimpulan dan cadangan berdasarkan kajian ini.