UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

SOLUTION OF BLASIUS EQUATION USING INTEGRAL ITERATIVE METHOD (IIM)

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ABSTRACT

The Integral Iterative Method (IIM) was applied in this research to solve the two different forms of the Blasius equation. The Blasius equation is one of the most important equations in fluid dynamics. Blasius equation describes the velocity profile of the fluid in the boundary layer on a half infinite interval or flat plate. There were many methods have been approached to solve the problem related to the Blasius equation such as the Homotopy Perturbation Method (HPM), the Variational Iterative Method (VIM) and the Adomian Decomposition Method (ADM). However, the calculations of these methods take up too much computer memory since the data being processed is so large. Hence, this paper research presents the outcomes of the research findings with three main objectives, where we used the Integral Iterative Method (IIM) to solve the Blasius equation, examine the reliability and relevance of the IIM in solving the two forms of Blasius equations, followed by determining the precision and efficiency of the IIM compared to other existing methods used before such as Variational Iterative Method (VIM), Differential Transform Method (DTM), and Semi-Analytical Iterative Method (SAIM). Apart from that, Padé Approximant and simple Series Approximant methods are used after the IIM had been implemented into both forms of the Blasius equations. Regarding to the study's findings, it has been identified that the IIM is a simpler method in its computational procedures. The techniques used in this study introduced an easier and straightforward mathematical method to solve various differential equations.