



*mathematics*



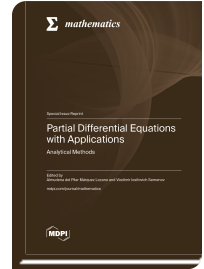
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## **Partial Differential Equations with Applications: Analytical Methods**

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Differential equations are essential for describing a real-world system as a mathematical model. Particularly, it is well known that partial differential equations are used extensively in physics and engineering, where problems involve functions of several variables, such as the propagation of heat or sound, fluid flow, elasticity, etc. Over the last few years, a wide variety of methods have been developed to find analytical solutions to partial differential equations. Currently, symmetry methods are intensively applied to solve partial differential equations obtaining exact analytic solutions. Additionally, finding conservation laws or conserved quantities plays an important role in the solution of a problem. Furthermore, there has been considerable research on Painlevé-type equations since 1980. Specifically, Painlevé tests have been shown to be remarkable in their ability to predict whether an equation is integrable.



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