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# On Application of Fourier Series

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**Abstract**

The Fourier series, the founding principle behind the field of Fourier analysis, is an infinite expansion of a function in terms of sines and cosines. In physics and engineering, expanding functions in terms of sines and cosines is useful because it allows one to more easily manipulate functions that are, for example, discontinuous or simply difficult to represent analytically. In particular, the fields of electronics, quantum mechanics, and electrodynamics all make heavy use of the Fourier series. In this paper we use the concept of Fourier series to solve the non linear Partial Differential Equation.

**Keywords**: Fourier series, Non linear partial differential equation

## 1. INTRODUCTION

The solutions of nonlinear partial differential equations play an important role in the study of many physical phenomena. With the help of solutions, when they exist, the mechanism of complicated physical phenomena and dynamical processes modelled by these nonlinear partial differential equations can be better understood. They can also help to analyze the stability of these solutions and to check numerical analysis for these nonlinear partial differential equations. Large varieties of physical, chemical, and biological phenomena are governed by nonlinear partial differential equations. One of the most exciting advances of nonlinear science and theoretical physics has been the development of methods to look for solutions of nonlinear partial differential equations [7]. Solutions to nonlinear partial differential equations play an important role in nonlinear science, especially in nonlinear physical science since they can provide much physical information and more insight into the physical aspects of the problem and thus lead to further applications. Nonlinear wave phenomena of