

A NOTE ON SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS USING POWER SERIES

PRATIBHA PUNDLIK¹, ANIL KASHYAP², ABDUL JUNAID KHAN³

¹ Research Scholar, MATS University, Raipur (CG)

²BRSM College of Agricultural Engineering and Technology & Research Station, Mungeli
(CG)

³MATS University, Raipur (CG)

ABSTRACT

The method of power series solution is a traditional but strong method for Ordinary Differential Equations and Partial Differential Equations. However, despite their usefulness the application of this method has been limited to this particular kind of equations. We propose to use the method of Power Series to solve Non Linear Partial Differential Equations. We apply the method in several typical non linear partial differential equations in order to demonstrate the power of the method. This method ensures the theoretical exactness of the approximate solution and comparisons of the approximate solution with the exact one are determined.

KEY WORDS: Ordinary Differential Equations, Non Linear Partial Differential Equations, Power Series.

INTRODUCTION:

In present situation, the solution of non-linear partial differential equations is considered as a fundamental tool in the research of multidisciplinary areas, because both their implication in the public health problems and social impact in to solve real life problems. In fact, is mandatory to involve mathematical methods in the traditional research methodology of science areas like Biology, Cell Biology, Physiology, Physics, Chemistry, Chemical Physics and different branch of engineering etc. which helped by the technological advance in the computation, to incorporate a new age of knowledge in order to tackle real life problems.

Power Series Solution method has been limited to solve Linear Differential equations, both Ordinary [1, 2], and Partial Differential Equation [3, 4]. Linear Partial Differential Equation has traditionally been solved using the variable separation method because it permits to obtain a coupled system of Ordinary Differential Equation easier to solve with the Power Series