**Analysis Of Differential Equations By Using Fourier Transformation**

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**Abstract:** The linear non-homogeneous differential equations are generally solved by adopting by Laplace transform method or by method of variation of parameters or by method of undetermined coefficients. The paper inquires the linear non-homogeneous differential equations by applying Fourier Transformation. The purpose of paper is to prove the applicability of Fourier Transformations for the analysis of linear non-homogeneous differential equations.

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**Keywords:** Linear non-homogeneous differential equations, Fourier Transformations

**Introduction:**

It has been noticed that Fourier transformation is helpful for scientists, researches and engineers in number of ways. It is a mathematical tool which is used in the solving the linear non-homogeneous differential equations by converting it from one form into another form. It is used in solving different types of problems in Physics, material sciences etc. [1-15]. It is also used to convert the signal system into frequency domain for solving it on a simple and easy way [16-27]. We can also apply it to analyze non- homogeneous differential equations without solving the corresponding homogeneous differential equations. It has wide applications in different fields of engineering and technology besides basic sciences and mathematics [28-40].

F [= F [f]

F [

=

 F [f]

this result can be easily extended as

F [= F [f] n=0, 1, 2, 3…

**Formulation**

This can be written as

Taking Fourier Transform on both sides

or

Case-I: The singularities with in contour are

Therefore,

,

Case-I: when t

,

But,

,

This can be written as

Taking Fourier Transform on both sides

Or

Or

Now,

And,

And,

From (3),

**Conclusion:**

In this paper we have applied the Fourier transformation Fourier Transformations for the analysis of linear non-homogeneous differential equations. It has been noticed that this technique is very much capable in finding solutions of linear non-homogeneous differential equations.

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