**Title : Solution of Singular Two-Point Boundary Value Problems using**

**Differential Transformation Method**

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**Abstract**

In this work, the differential transform method is applied to solve the singular two-point boundary value problems. Several examples are given to demonstrate the effectiveness of the present method.

**Keywords:** Differential transformation method, Singular two-points boundary value problems

**Introduction**

Consider the singular two-points boundary value problems (BVP)



subject to the boundary conditions

 or 

where  and are continuous functions on , and  and are real constants.

These problems generally arise frequently in many areas of science and engineering. Different numerical methods have been proposed by various authors for singular two-point boundary value problems, such as finite difference approximations [1] and variational iteration method [2]. The purpose of this work is to introduce the differential transform technique as an alternative to existing methods in solving singular two-point boundary value problems.

**Methodology**

The concept of differential transformation was first proposed by Zhou [3] in solving linear and nonlinear initial valued problems in electrical circuit analysis.

Let be analytic function and it can be expanded in Taylor series about  as



The differential transformation of is defined in [3] as



Then the inverse differential transformation is



The fundamental operations of differential transform method are listed in Table 1.

|  |  |
| --- | --- |
| Original function | Transformed function |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Table1 The fundamental operations of differential transform method.

**Results**

In this section, the numerical scheme to solve the singular two-points boundary value problems is presented.

Consider the singular two-point BVP



subject to the boundary conditions



By using the differential transformation method, the solution is .

If you have some figures you have to put it here as in Figure 1.



Figure1 Figure caption.

**References**

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