

# Review of: "A Novel Computational Approach for Solving Fully Implicit Singular Systems of Ordinary Differential Equations"

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Potential competing interests: No potential competing interests to declare.

This paper is dedicated to presenting a semi-analytical solution for a fully implicit differential equation with a point singularity.

Differential equations encompass a variety of singularities, which can be classified into different categories.

We would like to draw the authors' attention to the following reference:

Title: "Index definitions for nonlinear IAEs and DAEs: new classifications and numerical treatments"

The novelty of this paper lies in its approach, which combines the Adomian Decomposition method with the differential transform method to address singular ordinary differential equations (ODEs). The technique is expounded in Theorem 1 for first-order singular ODEs and in Theorem 2 for second-order singular ODEs, and it includes several illustrative examples.

The Differential Transform Method (DTM) has found applications in various works, as exemplified by:

Title: "A note on using the Differential Transformation Method for the Integro-Differential Equations" Published in Applied Mathematics and Computation 219 (14), 7306-7309, 2013

Additionally, for the Adomian Decomposition method, you may refer to:

Title: "Numerical solution of fractional differential equations in a model of HIV infection of CD4(+) T Cells" Published in the International Journal of Applied Mathematics and Statistics, 56, 23-32, 2017

As previously mentioned, singularities can exhibit diverse characteristics, including those within intervals, leading to what is known as a Differential Algebraic Equation (DAE). It is suggested that the author include a review of such works to provide readers with a broader perspective on the phenomenon of singularity in ODEs. For further exploration, please consider the following references:

Title: "Numerical solution of higher index DAEs using their IEA's structure: Trajectory-prescribed path control problem and simple pendulum" Published in the Caspian Journal of Mathematical Sciences (CJMS) 7 (1), 1-15, 2018

Also, explore advanced research, such as:

Title: "System of fractional differential-algebraic equations with applications" Published in Chaos, Solitons & Fractals 120, 203-212, 2019.