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.

Review of the manuscript:

“A Novel Computational Approach for Solving Fully Implicit

Singular Systems of Ordinary Differential Equations"

In this paper, the authors present a novel computational approach to solve fully implicit singular nonlinear systems of ordinary differential equations. The authors believe that these systems have a two fold difficulty: being fully implicit and singular at the same time. There these systems cannot be solved in general by software packages such as Maple due to their fully implicit structure. Furthermore, numerical methods like Runge-Kutta cannot be applied. The proposed method in this paper is based on the idea of applying the differential transform method (DTM) directly to these systems while exploiting an important property of Adomian polynomials. To illustrate the capability and efficiency of the proposed method, four numerical examples that are not solvable by software packages like Maple are given.

In my opinion, this paper presents some weaknesses which need to be removed in order to make it suitable for publication. I suggest the authors carefully check the whole paper in order to improve it. Here is the list of my comments.

1. I think that Eq. (6) needs to be checked. Please note to indexes in this formula.

2. According to Eq. (6) the formulas on page 4 (above Eq. (8)) are confusing for me. Please explain how these are obtained?

3. On page 5, in Theorem 1, Please check the

$$F_{k-1}$$

. It seems that this is incorrect.

4. Please check Eqs. (26) and (27) carefully. These are incorrect.

5. Please carefully compute the A matrix in Eq. (36). It seems that A is incorrect.

6. Please compute

$$r_{k-1}$$

or

$$r_{k-2}$$

numerically in one of the examples.

7. Please explain how to calculate matrices A and B in Eq. (71).

8. There are some grammatical errors. Please check the whole of the paper, carefully.

9. The references in this paper are in different styles and it is not suitable. Please choose a unique style for references.

10. The author believes that the presented method obtains the exact solution. Can the author compare the solution of one presented example with other methods?