Interactive comment on "Numerical Solution and Application of Time-Space Fractional Governing Equations of One-Dimensional Unsteady Open Channel Flow Process" *by* Ali Ercan and M. Levent Kavvas

Anonymous Referee #2

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The Authors present a paper focusing on the fractional time-space fractinal governing equations. They propose a Finite Difference numerical solution and provide a simple academic test case

The work focuses solely on the numerical aspects of fractional time-space governing equations methods. In my view, the nuerical technique itself is obsolete. Considering the type of Journal and their main scopes and covered topics, the paper seems to me out of place. Another concern is related to the missing an application with a real comparison with experimental data. I see only ruminations between numerical solutions. A

strong limit of the paper is that it is only one example and it is a synthetic test.

countless numerical solvers exist today for the numerica solution of the physical problem the authors solve. I think it is appropriate that the authors provide guidance on the applicability of their model, as well as the benefits to apply their model instead of other solvers.

Authors should: 1) provide the treatment of the boundary conditions

2) present some applications with experimental data. It would be appropriate to see how their solvers behaves in a real case with real river topography.

3) indicate, on the basis of these applications, the ranges of applicability of their proposed methodology, that is, if in some cases it would be better to solve equations with exponents equal to 1 (de Saint Venant equations), to achieve higher stability of the numerical method.

4) provide an analysis of the computational costs, which could direct the reader to the choice of a numerical method rather than another

In conclusion, I believe that the authors should review the article on the basis of the indications reported above, and that the work in its present form is not ready to be published