Review of: "New adaptative numerical algorithm for solving partial integro-differential equations"

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Review of the article "New adaptive numerical algorithm for solving partial integro-differential equations"

This article deals with new adaptive numerical algorithm for solving partial integro - differential equations.

The paper introduces an accurate numerical approach based on orthonormal Bernoulli polynomials for solving parabolic partial integro - differential equations (PIDEs). This type of equations arises in physics and engineering. Some operational matrixes are given for these polynomials and are also used to obtain the numerical solution. By this approach, the problem is transformed into a nonlinear algebraic system. Convergence analysis is given and some experiment tests are studied to examine the good accuracy of the numerical algorithm, the proposed technique is compared with some other well-known methods.

Various approximations by orthonormal family of functions have been investigated in physical sciences, engineering, etc. This type of numerical approximations can be also used in optimal control problems and in general to approximate solutions of dynamical systems. Integral equations arise in many physical problems, diffusion problems, concrete problem of physics and mechanics and some others problems of engineering, different applications of potential theory, synthesis problem, mathematical modelling of economics, population, geophysics, antenna, genetics, communication theory, radiation problems, concerning transport of particles, etc.

I can say that the work is very well written, the results are new. The theorems are fully proven and correct. Several examples are given that fully reveal the meaning of this study. The results are presented in a table and also shown in drawings.

I would like to make the following remarks regarding the article:

1) The grammar of the article should be corrected, for example, the title of the article contains the words "adaptative", this word should be written as "adaptive"; in the abstract section the word "acurrate" should be written as "accurate"; the word "appraoch" should be written as "approach" and then.

2) Formula (35) has gone beyond the page, I advise you to write it on a new line.

3) In some formulas it is correct to put punctuation marks, for example in formula (13) you need to put a period, not a comma, in the formula after the formula you need to put punctuation marks (15).

These comments do not affect the meaning and quality of the article; it can be easily corrected.

With the exception of minor corrections, I recommend this article for publication.

Best regards, Reviewer

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