

# APPROXIMATION OF SOLUTIONS TO THE HIGHER ORDER FRACTIONAL BOUNDARY VALUE PROBLEMS

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## ABSTRACT

Fractional differential equations have been waking a high interest during the last decades. The variety of their applications in fluid dynamics, biology, physics, engineering and economics lead to development of techniques to study behavior of solutions of the aforementioned equations and their systems. Since most processes in the real world are of the nonlinear nature, the particular attention is to be paid to the nonlinear boundary value problems. Construction of their exact solutions may be impossible or one may even face computational difficulties trying to find their analytical representation. However, the precise approximate methods help to simplify and even solve this task.

In my talk I will present some recent results in approximation of solutions to the nonlinear fractional boundary value problems subjected to periodic boundary conditions of the higher order. The so-called numerical-analytic technique, applied to this problem, allows us to obtain an explicit approximate solution with high precision [1, 2]. The advantage of this approach over other existing methods will be further discussed.

## REFERENCES

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- [2] Fečkan, M.; Marynets, K. Approximation Approach to Periodic BVP for Mixed Fractional Differential Systems. *Journal of Computational and Applied Mathematics* 2018, 339, 208-217.

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