

SEMINAR

Grupo de Análise Funcional e Aplicações Functional Analysis and Applications Group

Existence and uniqueness of solution for fractional differential equations with integral boundary conditions and the Adomian Decomposition Method

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Abstract

We propose an Adomian decomposition method to solve a class of nonlinear differential equations of fractional-order with Caputo derivatives and integral boundary conditions. Our approach uses the integral boundary conditions to derive an equivalent nonlinear Volterra integral equation before establishing existence and uniqueness of solution and a recursion scheme for the solution. The convergence of the method is proved and an error analysis given. Two numerical examples are solved by obtaining a rapidly converging sequence of analytical functions to the solution.

Room *Room 11.2.23*

March 30, 2023 - 14:00

This seminar is supported in part by the Portuguese Foundation for Science and Technology (FCT - Fundação para a Ciência e a Tecnologia), through CIDMA - Center for Research and Development in Mathematics and Applications, within project UIDB/04106/2020.