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Fixed Point Results in Generalized Rectangular Metric Spaces in the Sense of Branciari and Their Applications

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Abstract

In this work, we will introduce a new type of space called the generalized rectangular b-pseudo metric space, which generalizes the concept of metric space, rectangular metric space, b-rectangular metric space, and pseudo metric space. Next, we will prove a generalization of the famous alternative fixed point theorem of Diaz and Margolis in such space. As applications of our result, we will study the Ulam-stability of a delay differential equation with multiple variable time delays, and we will prove also the existence and uniqueness of the solution to a Fredholm integral equation. This talk is based on the article [1]

Keywords: Alternative fixed point theorem, delay differential equations, fixed point method, Fredholm integral equation, function space, gauge space, generalized metric space, multiple variable delays, rectangular b-metric space, Ulam-stability.

References:

[1] C.Benzarouala, L.Oubbi and C.Tunç, Fixed point results in generalized rectangular metric spaces in the sense of Branciari and their applications. Math. Methods Appl. Sci. 49 (2026), no. 2, 668–675.

[2] C. Benzarouala and L. Oubbi, A fixed point theorem in gauge spaces and applications to Ulam-Hyers-Rassias-stability of delay differential equations. Afr. Mat. 36 (2025), no. 1, Paper No. 28, 14 pp.