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Different Types of Stabilities for a Class of Integro-Differential Equations

Alberto Simões
(Auxiliar Professor, asimoes@ubi.pt)
University of Beira Interior, Department of Mathematics and Center of
Mathematics and Applications of University of Beira Interior (CMA-UBI),
Portugal

Abstract

An interesting and famous talk presented by S. M. Ulam [5] in 1940 triggered the study of stability problems for various functional equations. Ulam discussed a number of important unsolved mathematical problems. Among them, a question concerning the stability of homomorphisms seemed too abstract for anyone to reach any conclusion. In the following year, D. H. Hyers was able to give a partial solution to Ulam's question that was the first significant breakthrough and step toward more solutions in this area. After

that preliminary answer, other approaches emerged, and new orientations were introduced by Th. M. Rassias, see [3], introducing therefore the so-called Hyers-Ulam-Rassias stability. Different generalizations were obtained by other researchers, by considering the possibility of using different involved norms and others types of equations, in particular by Aoki [1], Gajda [2], and Rassias [4]. In this talk we will be devoted to introduce the concepts of Hyers-Ulam, Hyers-Ulam-Rassias and σ-semi-Hyers-Ulam stabilities for some classes of integro-differential equations of Volterra type and Fredholm type.

Keywords: Hyers-Ulam stability, σ-semi-Hyers-Ulam stability, Hyers-Ulam-Rassias stability, Banach fixed point theorem, Bielecki metric, nonlinear integral equation, integro-differential equations.

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