



Existence results and monotone iterative technique for impulsive hybrid functional differential systems with anticipation and retardation

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Abstract

We study some existence results for impulsive hybrid functional differential equations with anticipation and retardation by using the existence theory of impulsive hybrid delay differential equations. The monotone iterative technique relative to the coupled lower and upper solutions has also been developed for impulsive hybrid functional differential equations with both anticipation and retardation.

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1. Introduction

A number of research papers has recently dealt with the theoretical developments and applications in the modeling and computing of anticipatory systems in certain fields of natural and artificial systems. Computing anticipatory systems involve differential delayed-advanced equations. Delayed systems are based on a memory of past states and advanced systems are systems which depend explicitly on their anticipatory future potential states. With the help of the laws of evolution considered at the current time for any physical system, the past and future states need to be defined by the new variables at the current time, taking into account some hidden mechanisms for their existence and knowledge at the current time because the past states no more exist at the current time and the future states are not yet actualized. Some delayed-advanced systems can be transformed to functional differential systems with FPP (future, present and past) dependence. Mathematically, new variables defined by equations at the current time, are introduced in view of computing, by synchronization, past and/or future states. However, the investigation of general functional differential systems with FPP

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