Existence of a Positive Solution for a Right Focal Dynamic Boundary Value Problem

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Abstract: In this work, an application is made of an extension of the Leggett-Williams fixed point theorem to a second-order right focal dynamic boundary value problem which requires neither of the functional boundaries to be invariant. In conclusion, two nontrivial examples are provided.

Keywords: *fixed point theorem; dynamic equation; time scale; functional.*

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1 Introduction

For years, fixed point theory has found itself as a center of study for boundary value problems. Many results have provided criteria for the existence of positive solutions or multiple positive solutions using fixed points of operators. Some of these results can be seen in the works of Guo [10], Krosnosel'skii [12], Leggett and Williams [13], and Avery et al. [1, 3, 6].

Applications of the aforementioned fixed point theorems have been seen in works dealing with ordinary differential equations [2,5,9] and finite difference equations [4,7,11], and most relevant to this paper, the theorems have been utilized for results that involve dynamic equations on time scales [8, 14, 15].

In this paper, we show an application of the recent extension of the Leggett-Williams fixed point theorem by Avery et al. [1] to a right-focal dynamic boundary value problem on a time scale.

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