

DENUMERABLY MANY POSITIVE SOLUTIONS FOR ITERATIVE SYSTEM OF FRACTIONAL ORDER BOUNDARY VALUE PROBLEMS WITH RS-INTEGRAL BOUNDARY CONDITIONS

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Abstract. In this paper, we consider an iterative system of fractional order boundary value problems with Riemann-Stieltjes integral boundary conditions. By applying Krasnoselski's cone fixed point theorem on a Banach space, we derive sufficient conditions for the existence of denumerably many positive solutions to the boundary value problem.

1. Introduction

Differential equations have wide applications in various engineering and science disciplines. In general, modeling of the variation of a physical quantity, such as temperature, pressure, displacement, velocity, stress, strain, current, voltage, or concentration of a pollutant, with the change of time or location, or both would result in differential equations. There are many techniques to solve a differential equations, see [7, 12, 13, 16–18] and references therein. On the other hand, fractional derivative gives a perfect aid to characterize the memory and hereditary properties of various processes and materials, therefore differential equations of fractional order are being used in modeling of electrical and mechanical properties of various real materials, rock's rheological properties, and in many other areas [3]. In the qualitative theory of (classical and fractional) differential equations, various theorems have been extensively deployed by researchers in establishing the existence and uniqueness of solutions to both the initial

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