

**EXISTENCE THEORY FOR NABLA FRACTIONAL
THREE-POINT BOUNDARY VALUE PROBLEMS
VIA CONTINUATION METHODS
FOR CONTRACTIVE MAPS**

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ABSTRACT. In this article, we analyse an α -th order, $1 < \alpha \leq 2$, nabla fractional three-point boundary value problem (BVP). We construct the Green's function associated to this problem and derive a few of its important properties. We then establish sufficient conditions on existence and uniqueness of solutions for the corresponding nonlinear BVP using the modern ideas of continuation methods for contractive maps. Our results extend recent results on nabla fractional BVPs. Finally, we provide an example to illustrate the applicability of main results.

1. Introduction

Integer-order discrete non-local BVPs have been studied extensively in the literature. One can refer [6], [11], [12], [18], [26] and the references therein for this purpose. Due to the importance of discrete multipoint BVPs in the integer-order literature, it seems interesting to investigate the similarities and differences between the classical problems and the fractional problems. One interesting difference is that the order of the nabla fractional difference equation may affect the admissible structure of the three-point boundary condition. However, this

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