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PII: S0377-0427(18)30265-6
DOI: https://doi.org/10.1016/j.cam.2018.04.062
Reference: CAM 11659

To appear in: *Journal of Computational and Applied Mathematics*

Received date : 25 July 2017
Revised date : 9 April 2018

Please cite this article as: G. Wang, K. Pei, R.P. Agarwal, L. Zhang, B. Ahmad, Nonlocal Hadamard fractional boundary value problem with Hadamard integral and discrete boundary conditions on a half-line, *Journal of Computational and Applied Mathematics* (2018), https://doi.org/10.1016/j.cam.2018.04.062

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Nonlocal Hadamard fractional boundary value problem with Hadamard integral and discrete boundary conditions on a half-line *

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Abstract

This article investigates a new class of boundary value problems of one-dimensional lower-order nonlinear Hadamard fractional differential equations and nonlocal multi-point discrete and Hadamard integral boundary conditions. By using monotone iterative method, we not only seek the twin positive solutions of the problem but also show that the monotone iterative schemes converge to a unique positive solution of the problem. An error estimate formula is also given. For the illustration of the main results, we construct an example.

Keywords: Fractional differential equations; Hadamard integral and discrete boundary conditions; Monotone scheme; Infinite interval.

1 Introduction

Fractional differential equations received considerable attention due to their ability to model

*Supported by National Natural Science Foundation of China(No.11501342) and the Scientific and Technological Innovation Programs of Higher Education Institutions in Shanxi(Nos.2014135 and 2014136). The authors thank the reviewers for their useful comments that led to the improvement of the original manuscript.

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