

# ON A NONLOCAL PROBLEM INVOLVING FRACTIONAL $p(x, \cdot)$ -LAPLACIAN WITH NON-STANDARD GROWTH\*

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## Abstract

We are concerned in a nonlocal problem involving the fractional  $p(x, \cdot)$ -Laplacian operator and with a right-hand side that is a Carathéodory function satisfying only a non-standard growth condition. We show that our problem admits at least one weak solution. In order to do this, the main tool is the Berkovits degree theory for abstract Hammerstein type mappings.

**MSC:** 35R11, 35S15, 47H11.

**keywords:** Fractional  $p(x, \cdot)$ -Laplacian operator, Nonlocal problem, Topological degree.

## 1 Introduction

The use of the functional framework provided by the classical Lebesgue and Sobolev spaces  $L^p$  and  $W^{1,p}$  has shown to be not appropriate for studying various materials which present inhomogeneities. Indeed, for such materials the exponents involved in the constitutive law could be variable, which requires the use of the spaces  $L^{p(x)}$  and  $W^{1,p(x)}$ . The use of these spaces

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