

MULTIPLE SOLUTIONS TO BAHRI–CORON PROBLEM INVOLVING FRACTIONAL p -LAPLACIAN IN SOME DOMAIN WITH NONTRIVIAL TOPOLOGY

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ABSTRACT. In this article, we establish the existence of positive and multiple sign-changing solutions to the fractional p -Laplacian equation with purely critical nonlinearity

$$(P_{p,\Omega}^s) \quad \begin{cases} (-\Delta)_p^s u = |u|^{p_s^*-2}u & \text{in } \Omega, \\ u = 0 & \text{on } \Omega^c, \end{cases}$$

in a bounded domain $\Omega \subset \mathbb{R}^N$ for $s \in (0, 1)$, $p \in (1, \infty)$, and the fractional critical Sobolev exponent $p_s^* = Np/(N - sp)$ under some symmetry assumptions. We study Struwe's type global compactness results for the Palais–Smale sequence in the presence of symmetries.

1. Introduction

In the present work, we study the existence of positive and multiple sign-changing solutions to purely critical exponent problem involving fractional p -Laplacian operator. Let Ω be a smooth bounded domain in \mathbb{R}^N , $1 < p < \infty$, $0 < s < 1$ such that $sp < N$. We consider the following non-local critical

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