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SIGN-CHANGING SOLUTIONS FOR THE BOUNDARY VALUE PROBLEM INVOLVING THE FRACTIONAL p-LAPLACIAN

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Abstract. In the paper, we consider the following boundary value problem involving the fractional p-Laplacian:

$$(\mathcal{P}) \qquad \begin{cases} (-\triangle)_p^s u(x) = f(x,u) & \text{in } \Omega, \\ u(x) = 0 & \text{in } \mathbb{R}^N \setminus \Omega. \end{cases}$$

where Ω is a bounded smooth domain in $\mathbb{R}^N$ with $N \geq 1$, $(-\Delta)_p^s$ is the fractional p-Laplacian with $s \in (0,1)$, $p \in (1, N/s)$, $f(x,u)\colon \Omega \times \mathbb{R} \to \mathbb{R}$. Under the improved subcritical polynomial growth condition and other conditions, the existences of a least-energy sign-changing solution for the problem $(\mathcal{P})$ has been established.

1. Introduction

Let Ω be a bounded domain in $\mathbb{R}^N$ with smooth boundary. In this paper, we consider the following boundary value problem involving the fractional p-Laplacian:

$$(\mathcal{P}) \qquad \begin{cases} (-\triangle)_p^s u(x) = f(x,u) & \text{in } \Omega, \\ u = 0 & \text{in } \mathbb{R}^N \setminus \Omega. \end{cases}$$

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