THE SIGN-CHANGING SOLUTIONS
FOR A CLASS OF NONLOCAL ELLIPTIC PROBLEM
IN AN ANNULUS

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ABSTRACT. In this paper, using the fixed point index method, we present a result on the existence of sign-changing solutions for a class of nonlocal elliptic problem in an annulus.

1. Introduction

In this paper, we consider the following nonlocal elliptic problem

$$(1.1) \qquad \begin{cases} -a\bigg(\displaystyle\int_\Omega |u(x)|^\gamma \, dx\bigg)\Delta u = f(u) & \text{for } x \text{ in } \Omega, \\ u(x) = 0 & \text{for } x \text{ on } \partial\Omega, \end{cases}$$

where $\Omega = \{x \in R^N \mid 0 < r_1 < |x| < r_2\}$ $(N \geq 3)$ is an annulus, $\gamma \in (0, +\infty)$, $a \in C([0, +\infty), (0, +\infty))$ and $f \in C((-\infty, +\infty), (-\infty, +\infty))$.