

EXISTENCE OF SOLUTIONS FOR THE SEMILINEAR CORNER DEGENERATE ELLIPTIC EQUATIONS

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ABSTRACT. In this paper, we are concerned with the following elliptic equations:

$$\begin{cases} -\Delta_{\mathbb{M}} u = \lambda f & \text{in } z := (r, x, t) \in \mathbb{M}_0, \\ u = 0 & \text{on } \partial\mathbb{M}. \end{cases}$$

Here, $\lambda > 0$ and $M = [0, 1) \times X \times [0, 1)$ as a local model of stretched corner-manifolds, that is, the manifolds with corner singularities with dimension $N = n + 2 \geq 3$. Here X is a closed compact submanifold of dimension n embedded in the unit sphere of \mathbb{R}^{n+1} . We study the existence of nontrivial weak solutions for the semilinear corner degenerate elliptic equations without the Ambrosetti and Rabinowitz condition via the mountain pass theorem and fountain theorem.

1. Introduction

In this paper, we are concerned with some results about the existence and multiplicity of weak solutions for elliptic equations in a domain \mathbb{M} :

$$(1.1) \quad \begin{cases} -\Delta_{\mathbb{M}} u = \lambda f & \text{in } z := (r, x, s) \in \mathbb{M}_0, \\ u = 0 & \text{on } \partial\mathbb{M}. \end{cases}$$

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