MULTIPLICITY AND CONCENTRATION FOR KIRCHHOFF TYPE EQUATIONS AROUND TOPOLOGICALLY CRITICAL POINTS IN POTENTIAL

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ABSTRACT. We consider the multiplicity and concentration of solutions for the Kirchhoff Type Equation

$$-\varepsilon^2 M \left( \varepsilon^{2-N} \int_{\mathbb{R}^N} |\nabla v|^2 \, dx \right) \Delta v + V(x)v = f(v) \quad \text{in } \mathbb{R}^N.$$ 

Under suitable conditions on functions $M$, $V$ and $f$, we obtain the existence of positive solutions concentrating around the local maximum points of $V$, which gives an affirmative answer to the problem raised in [21]. Moreover, we also obtain multiplicity of solutions which are affected by the topology of critical points set of potential $V$.

1. Introduction

In this paper, we focus on the following Kirchhoff type equations:

$$\begin{cases}
-\varepsilon^2 M \left( \varepsilon^{2-N} \int_{\mathbb{R}^N} |\nabla v|^2 \, dx \right) \Delta v + V(x)v = f(v) \quad \text{in } \mathbb{R}^N, \\
v \in H^1(\mathbb{R}^N), \quad v > 0,
\end{cases}$$

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