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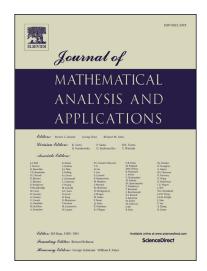
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ACCEPTED MANUSCRIPT

Ground state sign-changing solutions for the Schrödinger-Kirchhoff equation in \mathbb{R}^{3*}

Li Wang^a, Binlin Zhang^{b, \dagger} and Kun Cheng^c

Abstract

In this paper, with the help of variational methods in association with the deformation lemma and Miranda's theorem, we investigate the existence of a least energy sign-changing solution which has precisely two nodal domains for the following Schrödinger–Kirchhoff equation in \mathbb{R}^3 :

$$\begin{cases} -\left(a+b\int_{\mathbb{R}^3} |\nabla u|^2 dx\right) \Delta u + V(x)u = f(u) & \text{in } \mathbb{R}^3, \\ u \in H^1(\mathbb{R}^3), & \end{cases}$$

where a, b > 0 and the potential $V : \mathbb{R}^3 \to \mathbb{R}^+$ is locally Hölder continuous and not necessarily radially symmetric.

Keywords: Schrödinger-Kirchhoff; Ground state; Sign-changing solution; Variational methods.

2010 MSC: 35A15, 35J60, 46E35.

1 Introduction and main result

In this paper, we study the existence of a least energy sign-changing solution for the following Schrödinger–Kirchhoff equation:

$$\begin{cases} -\left(a+b\int_{\mathbb{R}^3} |\nabla u|^2 dx\right) \Delta u + V(x)u = f(u) & \text{in } \mathbb{R}^3, \\ u \in H^1(\mathbb{R}^3), \end{cases}$$
(1.1)

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