Multiple solutions for a class of quasilinear Choquard equations

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Abstract

In this paper, we study the following quasilinear Choquard equations of the form $$\ -\Delta u+V(x)u-\Delta (|u|ˆ{2\alpha})|u|ˆ{2\alpha-2}u=(|x|ˆ{-\mu}\ast G(u))g(u), \ x \ \in RˆN,$$ where $1\geq\alpha>\frac{1}{2}$, $V \in C(\mathbb{R}ˆN, \mathbb{R})$, $g \in C(\mathbb{R}ˆN, \ \mathbb{R})$. Distinguished from two situations $\lim\limits_{|x|\rightarrow\infty}V(x)=+\infty$ or $\lim\limits_{|x|\rightarrow\infty}V(x)<+\infty$, we research the existence of nontrivial solutions and a sequence of high energy solutions.

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Research area: Critical Point Theory and its Applications to Differential Equations.

Research Content: In this paper, we study the following quasilinear Choquard equations of the form

$$-\Delta u + V(x)u - \Delta(|u|^{2\alpha})|u|^{2\alpha-2}u = (|x|^{-\mu} * G(u))g(u),\ x\ \in R^N,$$

where $1 \geq \alpha > \frac{1}{2}$, $V \in C(\mathbb{R}^N, \mathbb{R})$, $g \in C(\mathbb{R}^N,\ \mathbb{R})$. Distinguished from two situations $\lim\limits_{|x|\to\infty} V(x) = +\infty$ or $\lim\limits_{|x|\to\infty} V(x) < +\infty$, we research the existence of nontrivial solutions and sequence of high energy solutions.