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Concentration and existence results for normalized solutions to ϱ-Laplacian like equations with logarithmic nonlinearity

Communication Info

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Abstract

In this paper, we study a normalized quasilinear elliptic problem in $\mathbb{R}^N$ driven by a ϱ-Laplacian like operator and involving a singular logarithmic nonlinearity. Assuming only $\mathcal{U} \in \mathcal{C}\hat{}\mathbf{0}(\mathbb{R}^N)$ and that $\mathcal{U}$ attains its global minimum at exactly κ isolated points, we prove the existence of at least κ positive normalized solutions for prescribed mass α sufficiently large and for $\varepsilon > 0$ small. Moreover, these solutions concentrate near the global minima of $\mathcal{U}$ as $\varepsilon \to 0^+$; in particular, their maximum points localize around $\{z^1, \dots, z^\kappa\}$ and uniform exponential decay estimates are obtained. The proof combines a constrained variational approach with concentration-compactness arguments and Orlicz-type tools tailored to the logarithmic term, together with a penalization scheme to restore compactness.

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