

On concentration of solution to a Schrodinger logarithmic equation with deepening potential well

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Abstract:

In this work we prove the existence of positive solution for the following class of problems

$$\begin{cases} -\Delta u + \lambda V(x)u = u \log u^2, & x \in \mathbb{R}^N, \\ u \in H^1(\mathbb{R}^N), \end{cases}$$

where $\lambda > 0$ and $V : \mathbb{R}^N \rightarrow \mathbb{R}$ is a potential satisfying some conditions. Using the variational method developed by Szulkin for functionals which are sum of a C^1 functional with a convex lower semicontinuous functional, we prove that for each $\lambda > 0$ large enough there exists a positive solutions and, as $\lambda \rightarrow +\infty$, such solutions converge to a positive solution of the limit problem in $\Omega = \text{int}(V^{-1}(\{0\}))$.