EXISTENCE AND CONCENTRATION OF GROUND STATE SOLUTION TO A CRITICAL $p$–LAPLACIAN EQUATION

XUDONG SHANG AND JIHUI ZHANG

Abstract. In this paper, we consider the existence and concentration behavior of positive ground state solution to the following problem

$$\begin{cases} -h^p \Delta_p u + V(x)|u|^{p-2} u = K(x)|u|^{q-2} u + |u|^{p^*-2} u, & x \in \mathbb{R}^N, \\ u \in W^{1,p}(\mathbb{R}^N), & u > 0, \ x \in \mathbb{R}^N, \end{cases}$$

where $h$ is a small positive parameter, $1 < p < N$, $\max\{p, p^* - \frac{p}{p-1}\} < q < p^*$, $p^* = \frac{Np}{N-p}$ is the critical Sobolev exponent, $V(x)$ and $K(x)$ are positive smooth functions. Under some necessary restrictions, we show that for small $h > 0$, the equation has a positive ground state solution. Furthermore, we establish the concentration property of such solutions when $h$ tends to zero.


Keywords and phrases: $p$-Laplacian, ground state, critical growth, positive solution.

REFERENCES


