
Nonsymmetric Positive Solutions for Symmetric Dirichlet Elliptic Problems

DAOMIN CAO

Institute of Applied Mathematics, Academy of Maths & System Sciences

The Chinese Academy of Sciences, P. R. China

E-mail: cao@amath6.amt.ac.cn

In this talk the speaker will present some results on the existence of non-radially symmetric positive solutions of the following radially symmetric problems when ε is small positive number:

$$\begin{cases} -\Delta u = |x|^\tau u^{\frac{N+2}{N-2}-\varepsilon} & x \in \Omega, \\ u > 0 & x \in \Omega, \\ u = 0 & x \in \partial\Omega, \end{cases} \quad (1)$$

where $N \geq 3$, Ω be the unit ball in \mathbb{R}^N centered at the origin and $\tau > 0$ be a given number.

and

$$\begin{cases} -\Delta u + (\frac{1}{\varepsilon} - h(x))u = (1 - f(x))u^p, & \text{in } \mathbb{R}^N, \\ u > 0, & \text{in } \mathbb{R}^N, \\ u \in H^1(\mathbb{R}^N), \end{cases} \quad (2)$$

where $h(x)$ and $f(x)$ are nonnegative radially symmetric functions in $L^\infty(\mathbb{R}^N)$, $h(x)$ and $f(x)$ have compact support in \mathbb{R}^N , $f(x) \leq 1$ for all $x \in \mathbb{R}^N$, $1 < p < +\infty$ for $N = 1, 2$, $1 < p < \frac{N+2}{N-2}$.