

DIRICHLET PROBLEM FOR A CLASS OF NONLINEAR DEGENERATE ELLIPTIC OPERATORS WITH CRITICAL GROWTH AND LOGARITHMIC PERTURBATION

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Venue: Zoom: 618 038 6257 Password: SCMS

Abstract:

In this talk, we shall give some results for existence of weak solutions for a class of degenerate elliptic Dirichlet problems with critical nonlinearity and a logarithmic perturbation, i.e.

$$(1) \quad \begin{cases} -(\Delta_x u + (\alpha + 1)^2 |x|^{2\alpha} \Delta_y u) = u^{\frac{Q+2}{Q-2}} + \lambda u \log u^2, \\ u = 0 \quad \text{on } \partial\Omega, \end{cases}$$

where $(x, y) \in \Omega \subset \mathbb{R}^N = \mathbb{R}^m \times \mathbb{R}^n$ with $m \geq 1, n \geq 0, \Omega \cap \{x = 0\} \neq \emptyset$ is a bounded domain, the parameter $\alpha \geq 0$ and $Q = m + n(\alpha + 1)$ denotes the homogeneous dimension of \mathbb{R}^N . When $\lambda = 0$, we know that the problem above has a Pohožaev-type non-existence result. Then for $\lambda \in \mathbb{R} \setminus \{0\}$, we establish the existences of non-negative ground state weak solutions and non-trivial weak solutions subject to certain conditions.