

中法偏微分方程学术研讨会会议日程

Agenda of China-France PDEs Seminar

日期/Date: 2025 年 10 月 13 日/Oct. 13th, 2025

地点/Location: 数学科学学院新楼/School of Mathematical Sciences USTC

时间/Time	报告人/Speaker	主持人/Chair	教室/Venue
09:00-09:05	麻希南致欢迎辞 Welcome Speech by Prof. MA Xinan		Classroom312
09:05-09:55	Laurent VERON	麻希南/Xinan MA	
10:20-11:00	Marie-Françoise BIDAUT-VERON	陈世炳/Shibing CHEN	
11:15-12:05	吴汪哲/Wangzhe WU		
14:30-15:20	陈虎元/Huyuan CHEN	侍述军/Shujun SHI	Classroom308
15:25-16:15	吴天/Tian WU	韦韡/Wei WEI	
16:35-17:25	Quoc-Hung Nguyen	沈舜麟/Shunlin SHEN	

一、参会人员（以姓氏拼音字母排序）:

陈虎元，上海数学与交叉学科研究

陈世炳，中国科学技术大学

麻希南，中国科学技术大学

Quoc-Hung NGUYEN，中国科学院数学与系统科学研究院

沈舜麟，中国科学技术大学

侍述军，哈尔滨师范大学

韦韡，南京大学

吴天，中国科学技术大学

吴汪哲，中国科学院数学与系统科学研究院

Laurent VERON, 图尔大学

Marie-Françoise BIDAUT-VERON, 图尔大学

二、报告信息

题目: Boundary singular problems for mixed quasilinear equations

报告人: Laurent VERON, 法国国家科研中心、图尔大学

时间: 10 月 13 日 9:05-9:55

地点: 新楼 312

摘要:

Joint work with Marie-Françoise Bidaut-Véron, Univ. Tours and Marta Garcia-Huidobro, UPC Santiago. Calc. Var. Part. Diff. Equ. 43 (2022)

We study the existence of solutions to the problem

$$\begin{aligned} -\Delta u + u^p - M|\nabla u|^q &= 0 && \text{in } \Omega \\ u &= \mu && \text{on } \partial\Omega, \end{aligned} \tag{0.1}$$

in a bounded domain Ω , where $p > 1$, $1 < q < 2$, $M > 0$, μ is a nonnegative Radon measure in $\partial\Omega$, and the associated problem with a boundary isolated singularity at $a \in \partial\Omega$,

$$\begin{aligned} -\Delta u + u^p - M|\nabla u|^q &= 0 && \text{in } \Omega \\ u &= 0 && \text{on } \partial\Omega \setminus \{a\}. \end{aligned} \tag{0.2}$$

The difficulty lies in the opposition between the two nonlinear terms which are not on the same nature. Existence of solutions to (0.1) is obtained under a capacity condition. Problem (0.2) depends on several critical exponents on p and q as well as the position of q with respect to $\frac{2p}{p+1}$.

题目: On Bernstein technique and Keller-Osserman estimate for some elliptic equations involving a gradient term

报告人: Marie-Françoise BIDAUT-VERON, 图尔大学

时间: 10月13日 10:20-11:00

地点: 新楼 312

摘要:

Here we consider some elliptic equations involving nonlinear terms of order 0 or 1, of the form

$$-\Delta u + F(u, |\Delta u|) = 0, \quad X \in \mathbb{R}^N \setminus \{0\}$$

We are concerned by the obtention of upper estimates of the solutions in a punctured ball $B_{r_0} \setminus \{0\}$ or in an exterior domain $\mathbb{R}^N \setminus \overline{B_{r_0}}$, and existence of global solutions in $\mathbb{R}^N \setminus \{0\}$. We talk on the use of combined Bernstein technique and

Osserman-Keller estimate of the gradient in some noncoercive cases: $F(u, |\Delta u|) = \pm |\Delta u|^q + f(u)$, where f is a positive power or an exponential, or $F(u, |\Delta u|) = u^p |\Delta u|^q$, and recall the open problems. We are also concerned by some extension to quasilinear operators.

题目: Liouville theorem for quasilinear elliptic equations in $\mathbb{R}^N$

报告人: 吴汪哲, 中国科学院数学与系统科学研究院

时间: 10 月 13 日 11:15-12:05

地点: 新楼 312

摘要: We prove Liouville theorem for the equation $\Delta_m v + v^p + M |\nabla v|^q = 0$ in $\mathbb{R}^n$, with $M \in \mathbb{R}$ in the critical and subcritical case. The proof is based on an integration identity and Young's inequality.

题目: Solutions of Semilinear Equations on the Integer Lattice Graphs

报告人: 陈虎元, 上海数学与交叉学科研究

时间: 10 月 13 日, 14:30-15:20

地点: 新楼 308

摘要: In this talk, I will present results on positive solutions to semilinear elliptic equations on lattice graphs, focusing on two specific models.

The first part concerns Kazdan–Warner-type equations $-\Delta u = \epsilon e^{\{ku\}} + \beta \delta_0$ on the two-dimensional integer lattice graph $\mathbb{Z}^2$. We establish the existence of a continuous family of finite-energy solutions.

In the second part, we study the existence and nonexistence of positive solutions to the Lane–Emden equation $-\Delta u = Qu^p$ on the d -dimensional integer lattice $\mathbb{Z}^d$, as well as in half-space and quadrant domains, with zero Dirichlet boundary conditions imposed in the latter two cases.

题目：Application of the invariant tensor technique on classification results

报告人：吴天，中国科学技术大学

时间：10月13日，15:25-16:15

地点：新楼308

摘要：

Abstract. By the invariant tensor technique, we establish classification results for the following three types of semilinear equations:

1. $\Delta u - f_1(u) + f_2(u) = 0$ on a closed manifold (M^n, g) with $\text{Ric} \geq (n-1)g$, where f_1 and f_2 satisfy that $(\frac{f_1}{f_2})' \geq -\frac{n}{f_2}$, $\log f_2$ is concave if $n = 2$, and $f_2^{\frac{n-2}{n+2}}$ is concave if $n \geq 3$.
2. $\Delta^2 u - \lambda_1 \Delta u + \lambda_2(1 - e^{4u}) = 0$ on a closed 4-manifold (M^4, g) , $0 < \lambda_2 \leq 4 + \lambda_1$ if $\frac{2}{129}(\sqrt{18673} - 64) \leq \lambda_1 \leq 2$, $0 < \lambda_2 \leq L_1(\lambda_1)$ if $-2 < \lambda_1 < \frac{2}{129}(\sqrt{18673} - 64)$, with

$$L_1(x) := \frac{2+x}{56(14-x)} \left[996 + 332x - 67x^2 + \sqrt[3]{A_1(x) + 42(14-x)\sqrt{3A_2(x)}} + \sqrt[3]{A_1(x) - 42(14-x)\sqrt{3A_2(x)}} \right],$$

$$A_1(x) := 252756288 - 470882880x + 170417232x^2 + 11016224x^3 \\ - 18178788x^4 + 3558300x^5 - 224785x^6,$$

$$A_2(x) := 619127091200 - 710561935360x + 194617078784x^2 + 70308920320x^3 \\ - 43978140992x^4 + 3834335296x^5 + 1625924432x^6 \\ - 352127584x^7 + 4233764x^8 + 4104276x^9 - 281961x^{10}.$$

3. $\Delta_b u - \lambda(u - u^\alpha) = 0$ on a torsion-free closed Cauchy-Riemannian manifold (M^{2n+1}, θ) with $\text{Ric} \geq (n+1)h$, where $1 < \alpha \leq \frac{n+2}{n}$, $0 < \lambda \leq \frac{n}{2(\alpha-1)}$.

I'll establish the invariant tensors respectively, and show the final identities with positivity. Last, I'll discuss the invariant tensor and the differential identity for a type of quasilinear equation, namely $\Delta_m u + f(u)|\nabla u|^q = 0$ in $\mathbb{R}^n$, where $uf'(u) \leq pf(u)$ with $A_2(p, q) < 0$ if $0 \leq q \leq \frac{m-1}{n-1}$, and $H(p, q) < 0$ if $q \geq \frac{m-1}{n-1}$ and $n \geq 3$.

$$A_2(p, q) = (n-m)p + (n-1)q - (m-1)\left(n + \frac{m-q}{m-1-q}\right),$$

$$H(p, q) = (n-2)(n-m)p^2 + [(n-1)(n-2)q - (m-1)n^2 \\ + (m-2)n + 2m-1]p - (n-1)q + (m-1).$$

These are joint works with Xi-Nan Ma, Qianzhong Ou, Xiao Zhou, Hua Zhu.

题目: Understanding Regularity in the Non-Cutoff Boltzmann Equation

报告人: Quoc-Hung NGUYEN, 中国科学院数学与系统科学研究院

时间: 10 月 13 日, 16:35-17:25

地点: 新楼 308

摘要: In this talk, I will discuss the critical regularity theory for the non-cutoff Boltzmann equation. In particular, I will present—for the first time—a Prodi - Serrin - Ladyzhenskaya-type blow-up criterion for this equation, providing a new perspective on potential singularity formation in kinetic theory. Furthermore, I will establish Green's function estimates for the linearized Boltzmann equation, representing the first result of this kind in the study of kinetic equations.