非线性分析及其应用研究生导师学术研讨会

主办：福建师范大学数学与统计学院；福建省分析数学及应用重点实验室；福建省应用数学中心（福建师范大学）；福建师范大学数学研究中心

会议组织者：陈建清，李永青，王志强

会议安排（2021 年 6 月 25 日-26 日）

时间	报告人	报告题目
6.25 上午	腾讯会议号：199 956 636	
8:30-8:35	开始	
8:35-9:20	杨敏波（浙江师范大学）	Existence and qualitative analysis for some elliptic equations with Stein-Weiss type convolution parts
休息 10 分钟		
9:30-10:15	窦井波（陕西师范大学）	Sharp weighted Sobolev inequality involving divergent operator with degeneracy and related sharp inequalities
10:15-11:00	蒋永生（中南财经政法大学）	Multiple solutions of the planar L_p dual Minkowski problem

6.25 下午	自由讨论	
6.26 上午	腾讯会议号：937 955 579	
8:30-9:15	冯美强（北京信息科技大学）	泛函方法及其在偏微分方程中应用
9:15-10:00	郭千桥（西北工业大学）	Multi-bubble nodal solutions to slightly subcritical elliptic problems with Hardy terms
休息 10 分钟		
10:10-10:55	刘祥清（云南师范大学）	Sign-changing solutions for a parameter-dependent quasilinear equation
10:55-	结束	

报告题目和摘要（按做报告的时间顺序排列）

2021 年 6 月 25 日上午; 腾讯会议号：199 956 636

一、报告人：杨敏波（浙江师范大学）

报告题目：Existence and qualitative analysis for some elliptic equations with Stein-Weiss type convolution parts

报告摘要：The aim of this talk is to introduce some recent results about the critical elliptic equations with Stein-Weiss type convolution parts

$$\displaystyle-\Delta u

=\frac{1}{|x|^{\alpha}}\left(\int_{\mathbb{R}^{N}}\frac{|u(y)|^{2_{\alpha, \mu}^{\ast}}}{|x-y|^{\mu}|y|^{\alpha}}dy\right)

|u|^{2_{\alpha, \mu}^{\ast}-2}u,~~~x\in\mathbb{R}^{N},$$

where the critical exponent is due to the weighted Hardy-Littlewood-Sobolev inequality and Sobolev embedding. We develop a nonlocal version of concentration-compactness principle to investigate the existence of solutions and study the regularity, symmetry of positive solutions by moving plane arguments. Some Liouville type results are also obtained for the nonpositive solutions. Moreover, the basic properties are also applied to study the existence and asymptotic behaviors for some problems with variational structure.

二、报告人：窦井波（陕西师范大学）

报告题目：Sharp weighted Sobolev inequality involving divergent operator with degeneracy and related sharp inequalities

In this talk we present the classification of all positive extremal functions to a sharp weighted Sobolev inequality on the upper half space, which involves divergent operators with degeneracy on the boundary. We show that such a weighted Sobolev inequality can be used to derive a sharp Sobolev type inequality involving Baouendi-Grushin operator, and deduce others weighted inequalities. This work joins with Liming Sun, Lei Wang and Meijun Zhu.

三、报告人：蒋永生（中南财经政法大学）

报告题目：Multiple solutions of the planar L_p dual Minkowski problem

报告摘要：In this talk, we consider with the planar L_p dual Minkowski problem. Through the compactness analysis of an associated constrained variational problem in Sobolev space, the solvability of the planar L_p dual Minkowski problem and the related functional inequality are established, upon which the multiple solutions to the planar L_p dual Minkowski problem are obtained. This is a joint work with Zhengping Wang and Yonghong Wu

2021年6月26日上午

四、报告人：冯美强（北京信息科技大学）

报告题目：泛函方法及其在偏微分方程中应用

报告摘要：报告主要介绍变分法、单调映射理论、Hilbert 距离理论和拓扑度方法等内容的发展及对连续函数空间、L^P 空间和 Orlicz 空间中偏微分方程的应用。报告内容和成果是和华北电力大学张学梅副教授共同完成。

五、报告人：郭千桥（西北工业大学）

报告题目：Multi-bubble nodal solutions to slightly subcritical elliptic problems with Hardy terms

报告摘要：The paper is concerned with the slightly subcritical elliptic problem with Hardy term

$$
\left\{
\begin{aligned}
-\De u-\mu\frac{u}{|x|^2} &= |u|^{2^{\ast}-2-\eps}u &&\quad \text{in } \Om, \\
u &= 0&&\quad \text{on } \pa\Om,
\end{aligned}
\right.
$$

in a bounded domain $\Om\subset\R^N$ with $0\in\Om$, in dimensions $N\ge7$. We prove the existence of multi-bubble nodal solutions that blow up positively at the origin and negatively at a different point as $\eps\to0^+$ and $\mu=\eps^\al$ with $\al>\frac{N-4}{N-2}$. In the case of $\Om$ being a ball centered at the origin we can obtain solutions with up to 5 bubbles of different signs. We also obtain nodal bubble tower solutions, i.e.~superpositions of bubbles of different signs, all blowing up at the origin but with different blow-up order. The asymptotic shape of the solutions is determined in detail. This is a joint work with Professor Thomas Bartsch.

六、报告人：刘祥清（云南师范大学）

报告题目：Sign-changing solutions for a parameter-dependent quasilinear equation

报告摘要：We consider quasilinear elliptic equations, including the following Modified Nonlinear Schrodinger Equation as a special example:

$$\begin{cases} \Delta u + \frac{1}{2} u \Delta u^2 + \lambda |u|^{r-2} u = 0, & \text{in } \Omega \\ u = 0, & \text{on } \partial\Omega \end{cases}$$

where $\Omega \subset R^N (N \geq 3)$ is a bounded domain with smooth boundary, $\lambda > 0$, $r \in (2,4)$. We prove as λ becomes large the existence of more and more sign-changing solutions of both positive and negative energies.