Variational inequalities for bilinear averages

Xinfeng Wu (吴新峰)

Variational inequalities have been extensively studied in ergodic theory, probability and harmonic analysis. In this talk, we discuss the q-variation inequalities for a class of bilinear averages, which cannot be reduced to the variational estimates for linear ones. This is based on a joint work with Prof. Guixiang Hong.

RD-properties of free groups

Yan Cheng (闫诚)

Let $\mathbb{F}_N$ be a free group generated by N generators. If a length function $\mathfrak{l}$ dominates a general word length function ℓ, i.e., there exists positive numbers a, b such that $\ell\leq a \mathfrak{l}+b$. Then $\mathbb{F}_N$ has property $RD^\frac{a\mathfrak{l}}{a+b}$.

L_p-L_q Fourier multipliers on locally compact quantum groups

Haonan Zhang (张浩楠)

In this talk I will prove that on a locally compact quantum group $\mathbb{G}$ with its dual $\hat{\mathbb{G}}$, on which left Haar weight φ and left dual Haar weight $\hat{\varphi}$ are both traces, a Fourier multiplier is bounded from $L_p(\mathbb{G},\varphi)$ to $L_q(\mathbb{G},\varphi)$ if its symbol lies in $L_{r,\infty}(\hat{\mathbb{G}},\hat{\varphi})$ for $1<p\leq 2\leq q<\infty$ and $\frac{1}{r}=\frac{1}{p}-\frac{1}{q}$. This generalizes H\"ormander's theorem on $\mathbb{R}^n$, Akylzhanov, Nursultanov and Ruzhansky's result on compact lie groups, and Akylzhanov and Ruzhansky's work on locally compact separable unimodular groups. The proof is new and simple, which employ a stronger version of the Hausdorff-Young inequality in locally compact quantum groups under our setting and H\"older's inequality in non-commutative Lorentz spaces. Also, using these techniques, the Paley type inequality, which is the main ingredient in H\"ormander's proof, can be shown easily.

Algebraic Calderón-Zygmund theory

Ruilian Xia (夏润莲)

In this talk, we present Calderón-Zygmund methods for general measure spaces admitting a Markov semigroup satisfying purely algebraic assumptions. This extends Calderón-Zygmund theory in the absence of nice metrics, but also yields alternative forms of the theory for classical spaces.

Best constant in noncommutative Rosenthal inequality

Lian Wu (吴恋)

We study noncommutative Rosenthal inequalities for sums of operators independent in the sense of Junge and Xu. We prove that the constant involved is of order $O(p/\log p)$ when $p\to \infty$, which is known to be optimal even in the commutative setting. A sharp estimate for sums of nonnegative independent operators is also established.

Dimension-free estimates for the vector-valued variational operators

Wei Liu (刘伟)

We study dimension-free L^p estimates for UMD lattice-valued q-variations of Hardy-Littlewood averaging operators associated with the Euclidean balls.

An introduction on BCP of Banach spaces

Jimeng Lu (卢霁萌)

We give a brief introduction on BCP of Banach spaces. A Banach space X is said to have the ball covering property (BCP) if its unit sphere can be covered by countably many open (or closed) balls off the origin. Examples of Banach spaces with and without the BCP will be illustrated. Some results concerning the relationship between renorming and the w*-separability of X* will be given, and related open problems will be presented.

On maximal subalgebras inside type II_1 factors

Chenxu Wen (文晨旭)

Approximation properties such as amenability, Haagerup property and weak amenability play very important roles in the study of operator algebras. For instance, Connes' classification of injective von Neumann algebras is one of the greatest achievement in operator algebras; in the recent two decades or so, Popa's deformation/rigidity theory, based on the interplay of approximation properties and Kazhdan's property (T) in the von Neumann algebra setting, lead to many fantastic structural results on non-amenable type II1 factors. It is thus natural to study subalgebras within a given II1 factor with certain approximation properties. In this talk we will focus on various concrete examples of maximal subalgebras.

On ergodic theorem for positive completely support separating complete contractions

Samya Kumar Ray

In this talk, we consider support separating operators on non-commutative L^p-spaces for 1<p<\infty. We show a non-commutative dilation theorem for completely support separating complete contractions. As applications, we establish an ergodic theorem and validity of non-commutative Matsaev's conjecture for this class of contractions. This is a joint work with Prof. Guixiang Hong and Simeng Wang.