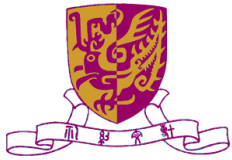


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Room 220, Lady Shaw Building, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong

Colloquium

An introduction to Restriction, Keakeya and Decoupling

Professor Diogo Oliveira e Silva
University of Bonn

Abstract

In a recent series of papers, J. Bourgain and C. Demeter provided proofs for the so-called ℓ^2 decoupling conjecture in a variety of contexts. In short, contributions of pieces of the Fourier transform localized to pairwise disjoint caps get decoupled via analytic, geometric and topological mechanisms. Tools include wave packet decompositions, parabolic rescaling, and multilinear tools related to the restriction and Keakeya problems from classical harmonic analysis. Consequences are vast, and range from analytic (proof of the discrete restriction conjecture) to combinatorial (improved bounds for additive energies) and number-theoretic (counting solutions to Diophantine equations, progress on the Lindelöf hypothesis). In particular, it is remarkable that significant progress in number theory is achieved via Fourier analysis only, and does not rely on any previous number theoretic results. A number of questions are still open and will likely be the focus of much research in the next few years.

In this colloquial lecture, we give a gentle introduction to the restriction problem, the Keakeya problem, and the decoupling problem, highlighting the connections between them.

Date: June 28, 2017 (Wednesday)
Time: 10:20am ~ 11:20am
Venue: Room 222, Lady Shaw Building,
The Chinese University of Hong Kong, Shatin

All are Welcome