

Probabilistic Operator Algebra Seminar

Organizer: Dan-Virgil Voiculescu

February 6 **Marek Bozejko**, University of Wrocław

Title: *Deformation of Voiculescu free Fock space and q -convolutions of probability measures on the real line*

In the talk we present many types of deformations of free Fock space using harmonic analysis on permutation groups and generalized Gaussian random variables like: q -Gaussian, q real, t -Gaussian of Kesten type. In that way we obtain q -Hermite polynomials (continuous and discrete discrete Hermite polynomials of type I and II) and Kesten type of orthogonal polynomials. Also, relations with combinatorics of 2-partitions also will be done, like: $cr(V)+nest(V) = 1/2ip(V)$ for 2-partition of $\{1, 2, \dots, 2n\}$. We give the construction of q -Discrete Fock spaces, q -Discrete Hermite polynomials, q -Discrete Brownian Motion and relations with matrix version of Khintchine inequality.

Main references : M. Bozejko and R. Speicher, An example of a generalized Brownian motion, Comm. Math. Physical. 1991 M. Bozejko, Deformed free probability of Voiculescu, Kogyuroku, 2001. M. Bozejko, Remarks on q -CCR relations for $|q| > 1$, Banach Center Publications, 2007. M. Bozejko and H. Yoshida, Generalized q -Deformed Gaussian random variables, Banach Center Publications, 2006. M. Bozejko, Deformed Fock spaces, Hecke operators and monotone Fock spaces of Muraki, Demonstratio Mathematica, 2012. M. Bozejko and W. Bozejko, Generalized Gaussian processes and relations with random matrices and positive definite functions on permutation groups, IDAQP, 2015. M. Bozejko and W. Bozejko, Deformation and q -convolutions. Old and new results, arXiv 2023.