Department of Mathematics

University of Houston

Analysis Seminar

Thursday, October 13, 2016

11:00-12:00 − Room 646 PGH

Speaker: Benben Liao (Shanghai Mathematics Center, Fudan University)

Title: Failure of approximation properties of Sp_4 over a non Archimedean local field and its lattices

Abstract: Let G be the symplectic group Sp_4 over a non Archimedean local field of any characteristic. We show that for $p \in [1, 4/3) \cup (4, \infty]$ neither the group G nor its lattices have the property of completely bounded approximation by Schur multipliers on Schatten p class (AP_{pcb}^{Schur}) defined by Lafforgue and de la Salle. As a consequence, for any lattice Γ in G, the associated non-commutative L^p space $L^p(L(\Gamma))$ of its von Neumann algebra $L(\Gamma)$ fails the operator space approximation property (OAP) and completely bounded approximation property (CBAP) for $p \in [1, 4/3) \cup (4, \infty]$. Together with previous work, one can conclude that lattices in a higher rank algebraic group over any local field do not have the group approximation property (AP) of Haagerup and Kraus. It is also shown that on some lattice Γ in Sp_4 over some local field, the constant function 1 cannot be approximated by radial functions with bounded (not necessarily completely bounded) Fourier multiplier norms on $L^p(L(\Gamma))$ for finite $p > 4$, nor on $C_r^*(\Gamma)$.