SEMINÁRIO DE ANÁLISE E EQUAÇÕES DIFERENCIAIS

Dia 21 de Julho (quinta-feira), às 13H30, na sala 6.2.33

Fermion hypercontractivity and quantum convolution inequalities

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Abstract:

The fermionic oscillator semigroup is a natural quantum analog of the classical Mehler semigroup, which is the semigroup generated by the bosonic number operator in its standard representation as an opertator on functions on Euclidean space with a Gaussian reference measure. The Mehler semigroup plays an important role in the proof of important inequalities that govern classical information theory. There is a very close analogy between the classical Mehler semigroup and its fermionic analog which was borne out in the proof of Gross's conjecture that that the fermionic semigroup should have the same optimal hypercontractivity properties as its classical cousin. The optimal fermion hypercontractivity inequality can be viewed as a quantum convolution inequality. We present some recent results developing this perspective, which are relevant to questions concerning the entropy power inequality in quantum information theory, and which are joint work with Elliott Lieb and Jan Maas.

Local: Departamento de Matemática, C6 - Piso 2, 6.2.33