Complex Interpolation between Banach, Hilbert and Operator spaces

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Abstract

The talks will describe various results proved using the complex interpolation method either in Banach Space Theory or in Operator Space Theory. Whenever possible special emphasis will be placed on illustrations in Harmonic Analysis. We will also include a characterization of the so-called θ-Hilbertian spaces: those Banach spaces B that can be written as $(B_0, B_1)_\theta$ where B_1 is Hilbert and B_0 an arbitrary Banach space.

In particular, we will present the results of a recent paper (available on Arxiv) where we describe the spaces

$$(B(\ell_{p_0}^n), B(\ell_{p_1}^n))_\theta \ , \ (B(\ell_{p_0}), B(\ell_{p_1}))^\theta \text{ or } (B(L_{p_0}), B(L_{p_1}))^\theta$$

for any pair $1 \le p_0, p_1 \le \infty$ and $0 < \theta < 1$. In the same vein, given a locally compact Abelian group G, let $M(G)$ (resp. $PM(G)$) be the space of complex measures (resp. pseudo-measures) on G equipped with the usual norm $\|\mu\|_{M(G)} = |\mu|(G)$ (resp.

$$\|\mu\|_{PM(G)} = \sup\{|\hat{\mu}(\gamma)| \mid \gamma \in \widehat{G}\}).$$

We describe similarly the interpolation space $(M(G), PM(G))^\theta$. Various extensions and variants of this result will be given, e.g. to Schur multipliers on $B(\ell_2)$ and to operator spaces.