SEMINARI D'ANÀLISI UAB-UB **Curs 2012–2013**

Dilluns 3 de juny del 2013, 15:00h

Aula T2 (UB).

Square functions, γ-radonifying operators and UMD spaces.

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ABSTRACT:

Let $\{T_t\}_{t>0}$ be a semigroup of operators associated to a differential operator and consider the square function (also called Littlewood-Paley-Stein g-function) defined by

$$g(\{T_t\}_{t>0})(f)(x) = \Big(\int_0^\infty |t\partial_t T_t(f)(x)|^2 \frac{dt}{t} \Big)^{1/2}, \quad x \in \mathbb{R}^n.$$

It is well-known that this g-function provides an equivalent norm to the usual one in L^p-spaces, in the sense that there exists $C > 0$ such that

$$\frac{1}{C}\|f\|_{L^p(\mathbb{R}^n)} \leq \|g(\{T_t\}_{t>0})(f)\|_{L^p(\mathbb{R}^n)} \leq C\|f\|_{L^p(\mathbb{R}^n)}, \quad f \in L^p(\mathbb{R}^n). \tag{0.1}$$

Suppose now that f is not a scalar function, but it takes values in a Banach space. Our aim is to obtain an analogous equivalence to (0.1) in a proper vector valued setting. This requieres to introduce γ-radonifying operators and restrict ourself to the class of Banach spaces with the UMD (*"Unconditional Martingale Difference"*) property.