SEMINARI D'ANÀLISI UAB-UB **Curs 2013–2014**

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Sufficient conditions for sampling and interpolation on the sphere

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ABSTRACT: The classical Marcinkiewicz-Zygmund inequality states that, for $1 < p < \infty$, there exist constants $C_p > 0$ such that for any $P \in \mathcal{P}_n$

$$\frac{C_p^{-1}}{2n+1} \sum_{k=0}^{2n} |P(\omega_{kn})|^p \leq \int_0^{2\pi} |P(e^{i\theta})|^p d\theta \leq \frac{C_p}{2n+1} \sum_{k=0}^{2n} |P(\omega_{kn})|^p,$$

where $\mathcal{P}_n$ stands for the space of trigonometric polynomials of degree at most n, $\omega_{kn} = e^{\frac{2\pi ik}{2n+1}}$ are the $(2n+1)$th roots of unity, and the constants C_p are independent of the degree n.

This result can be rephrased as saying that the array of roots of unity is both sampling and interpolating for the spaces of trigonometric polynomials with the L^p norm.

I will talk about the generalization of these concepts to the sphere $\mathbb{S}^d$, $d \geq 2$, and its relation with "well distributed" points on the sphere. Finally, I will present my recent work with B. Pridhnani about sufficient conditions for sampling and interpolation.