Barcelona Analysis Seminar **2021–2022**

URL . `https://mat.uab.cat/web/seminarianalisi/`

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Room. Room T2, Universitat de Barcelona

Online streaming (Zoom). https://ub-edu.zoom.us/j/95538016558

Words of analytic paraproducts on Bergman spaces

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An N-letter g-word is the composition $L = L_1 \cdots L_N$ of N operators L_j, where each L_j is either of the analytic paraproducts $T_g f(z) = \int_0^z (fg')(\zeta)d\zeta$, $S_g f(z) = \int_0^z (f'g)(\zeta)d\zeta$ and $M_g f(z) = (fg)(z)$, defined on the unit disc $\mathbb{D}$.

The boundedness of a single paraproduct on a classical weighted Bergman space A^p_α is well understood and the bounded 2-letter g-words on A^p_α have been recently described in a recent joint paper with A. Aleman, J. Fabrega, D. Pascuas and J.A. Peláez.

We prove that the boundedness of a N-letter g-word on A^p_α only depends on the symbol g, N and the total number n of Tg's that it contains. In fact, if $n \geq 1$ then an N-letter g-word L is bounded on A^p_α if and only if g belongs to the Bloch class of power functions

$$\mathscr{B}^{\frac{N}{n}} = \{h \text{ analytic on } \mathbb{D} : \|h\|^{\frac{N}{n}}_{\mathscr{B}^{\frac{N}{n}}} = \sup_{z\in\mathbb{D}} (1-|z|^2)|h(z)|^{\frac{N}{n}-1}|h'(z)| < \infty\},$$

and moreover $\|L\| \simeq \|g\|^N_{\mathscr{B}^{\frac{N}{n}}}$. If $n = 0$, then L is bounded on A^p_α if and only if $g \in H^\infty$, and $\|L\| \simeq \|g\|^N_{H^\infty}$.

This is a joint work in process.