SEMINARIO DE ANÁLISIS COMPLEJO (COMPLEX ANALYSIS SEMINAR)

Counterexample of normability in Hardy and Bergman spaces with $0 < p < 1$

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Abstract:

It is well-known from the literature on Hardy spaces that the Hardy spaces H^p, $0 < p < 1$, are not normable. The same is also true for the Bergman spaces A^p. However, none of the standard sources offer proofs of this fact. In 1953, Livingston published an article demonstrating this fact, using a convexity argument based on a theorem by Kolmogorov in order to prove the non-normability of H^p when $0 < p < 1$. In the case of the Bergman spaces, there is no proof of this fact in the literature, as far as we know.

In this talk, we will present a direct proof (based on a counterexample) that the usual expression for the norm when $1 \leq p < \infty$ is not a norm in the Hardy spaces H^p, $0 < p < 1$. In addition, we will show some counterexamples for the triangle inequality in A^p, $0 < p < 1$. This is a joint work with Dragan Vukotić.