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Aula T2 (UB)

Approximation by polynomial solutions of elliptic equations

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ABSTRACT:

Let L be a homogeneous elliptic differential operator in \mathbb{C} with constant complex coefficients. A function L is called L -analytic on an open set $U \subset \mathbb{C}$ if $Lf = 0$ in U ; a polynomial p is called L -polynomial if $Lp = 0$.

Let X be a compact set in \mathbb{C} , X° be its interior, and $m \geq 1$ be an integer. We consider the following problems:

- (1) What conditions on X are necessary and sufficient in order that each function which is continuous on X and L -analytic on X° can be uniformly approximated by L -polynomials, and
- (2) What conditions on X are necessary and sufficient in order that each function f which is of the class \mathcal{C}^m in a neighbourhood of X and L -analytic on X° can be approximated by some sequence (p_n) of L -polynomials so that $p_n \rightarrow f$ and $\nabla^k p_n \rightarrow \nabla^k f$ uniformly on X as $n \rightarrow \infty$ and $k = 1, \dots, m$?

In the talk it is planned to discuss the state of the art, some recent results and open questions in these themes.