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A subexponential vector-valued Bohnenblust-Hille type inequality

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Resumo

The Bohnenblust-Hille inequality for complex homogeneous polynomials ([3], 1931) asserts that there is a function $\mathcal{D} : \mathbb{N} \to [1, \infty)$ such that no matter how we select a positive integer N and an m-homogeneous polynomial P on $\mathbb{C}^N$, the $\ell_{\frac{2m}{m+1}}$-norm of the set of coefficients of P is bounded above by $\mathcal{D}(m)$ times the supremum norm of P on the unit polydisc. Having good estimates for $\mathcal{D}(m)$ is crucial for applications (for instance to the determination of the exact asymptotic growth of the Bohr radius). The best known estimates for $\mathcal{D}(m)$ are due to F. Bayart, D. Pellegrino and J. Seoane ([2]) and show that the growth of $\mathcal{D}(m)$ is subexponential. More precisely, in [2] it is shown that for any $\varepsilon > 0$, there is $\kappa > 0$ such that

$$\mathcal{D}(m) \leq \kappa(1 + \varepsilon)^m,$$

for all positive integers m.

We show that a vector valued polynomial Bohnenblust-Hille inequality on complex Banach lattices is also subexponential for some special cases. Our main result recovers the best known constants of the classical polynomial inequality provided in [2].

Our approach is inspired in ideas and results from [2]. This work is contained in [1].

Referências

[1] N. Albuquerque, D. Núñez-Alarcón and D. M. Serrano-Rodríguez. - *A subexponential vector-valued Bohnenblust-Hille type inequality*, arXiv:1405.1204v1 [math.FA] 6 May 2014.

[2] F. Bayart, D. Pellegrino and J. B. Seoane-Sepúlveda. - *The Bohr Radius of the n-dimensional polydisk is equivalent to* $\sqrt{(\log n)/n}$, Adv. Math. 264, (2014), 726-746.

[3] H. F. Bohnenblust and E. Hille, *On the absolute convergence of Dirichlet series*, Ann. of Math. (2) 32 (1931), 600-622.