

POLYNOMIAL PROPERTIES OF SPACES WITH COTYPE

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ABSTRACT. The Bohnenblust-Hille inequality, by now classical, bounds the $\frac{2m}{m+1}$ -norm of the coefficients of any scalar-valued polynomial of n variables and degree m by a constant that only depends on m multiplied by the supremum of the polynomial on the n -dimensional polydisc. Having a good control of the growth of the constant with the degree is very important for certain applications. It is known that these constants grow at most exponentially with the degree.

The notion of cotype appears in a natural way when trying to get an analogous inequality for polynomials taking values on a Banach space. In this case, however, so far the constants were known to grow exponentially only in some especial cases. In general only constants with very fast growth were known.

We show that in fact for every Banach space with finite cotype, an inequality with constants growing exponentially can be obtained.

More precisely, we show that if X has cotype q , then there is a constant C so that the q -norm of the coefficients of every polynomial of n variables and degree m is bounded by C^m multiplied by the integral of the polynomial on the n -dimensional torus. Some applications will be given.

This is a joint work with Daniel Carando and Felipe Marceca (Universidad de Buenos Aires, Argentina).