

Mahler's measure of polynomials and polynomial inequalities via Rademacher processes

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Abstract. We will discuss some recent works on polynomials inequalities. We prove an exact inequality between the L^p -norm of a polynomial P on \mathbb{T}^n and its Mahler's measure $M(P)$, which is the geometric mean of $|P|$ with respect to the normalized Lebesgue measure on \mathbb{T}^n . Using extrapolation we transfer this estimate into a Khintchine-Kahane type inequality, which for polynomials on \mathbb{T}^n relates a certain exponential Orlicz norm and Mahler's measure. We will also present new abstract inequalities for the expectation of the supremum norm of homogeneous Bernoulli polynomials on the unit ball of a Banach space. The development of this type of estimates was stimulated by the classical Kahane-Salem-Zygmund inequality and its recent extensions. We combine ideas from stochastic processes and interpolation theory to control increments of a Rademacher process in an Orlicz space via entropy integrals. The talk is based on the joint works with A. Defant and R. Szwedek.