ASYMPTOTIC BEHAVIOR OF ZEROS OF RANDOM POLYNOMIALS AND ANALYTIC FUNCTIONS

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For an analytic function G denote by μ_G the measure counting the complex zeros of G according to their multiplicities. Let $\xi_0, \xi_1, \ldots$ be non-degenerate independent and identically distributed random variables. Consider a random polynomial

$$G_n(z) = \sum_{k=0}^{n} \xi_k z^k.$$

The first question we are interested in is an asymptotic behaviour of the average number of real zeros of G_n as $n \to \infty$ under different assumptions on the distribution of ξ_0. Afterwards we consider all complex zeros of G_n and study the asymptotic behaviour of random empirical measure μ_{G_n}.

Finally, we consider the generalization of the previous problem to a random analytic function of the following form:

$$G_n(z) = \sum_{k=0}^{\infty} \xi_k f_{k,n} z^k.$$