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AN UPPER ESTIMATE FOR THE NUMBER OF LEVEL CROSSING OF A RANDOM ALGEBRAIC CURVE WHEN THE COEFFICIENTS FOLLOW SEMI-STABLE DISTRIBUTION

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Abstract

Let $\xi_1(\omega), \xi_2(\omega), \xi(\omega), \cdots, \xi_n(\omega)$ be a sequence of mutually independent, identically distributed random variables following semi-stable distribution with characteristic function $\exp(-(C + \cos\log|t|)|t|^\alpha), C > 1, 0 < \alpha \leq 2$. In this work, we obtain the upper bound of the number of real zeros of the random algebraic polynomial $\sum_{r=0}^{n} \xi_r(\omega)x^r$. If $N_n(\omega)$ denote the number of real roots of random algebraic polynomial, then $N_n(\omega) < \mu_1(\log\log n)^2 \log n$ for all $n > n_0$ out side a set of measure at most $\frac{\mu}{(\log n_0 - \log\log\log n_0)^{\alpha-1}}$.

Key Words and Phrases : *Random variables, Joint distribution, Characteristic function, Semi-stable distribution, Multiple roots, Random algebraic equations.*

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