

AVERAGE NUMBER OF MAXIMA OF A RANDOM SUM OF ORTHOGONAL POLYNOMIALS

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Abstract

Let $y = \sum_{k=0}^n Y_k(t)\psi_k(t)$ be a random polynomial such that $(Y_0(w), Y_1(w), \dots, Y_n(w))$ is a sequence of mutually independent normally distributed random variables with mean zero and variance one; $(\psi_0(t), \psi_1(t), \dots, \psi_n(t))$ be a sequence of normalized Jacobi polynomials, orthogonal with respect to the interval $(-1, 1)$. It is proved that the average number of maxima of the random equation $y = 0$ is asymptotic to $\frac{1}{2}\sqrt{\frac{3}{5}}n$.

Key Words : *Expected number of real zeros, Kac-Rice formula, Normal density, Jacobi polynomial.*

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