

**Farahmand, Kambiz**

**On the average number of level crossings of a random trigonometric polynomial.** (English)

Zbl 0708.60064

Ann. Probab. 18, No. 3, 1403-1409 (1990).

This is an interesting paper on the average number of level crossings of random trigonometric polynomials. The author obtains an asymptotic estimate of the average number of real roots of the equation  $\sum_{j=1}^n g_j(w) \cos j\theta = K$  in the interval  $0 \leq \theta \leq 2\pi$ , the coefficients  $g_j(w)$  being independent, standard normal random variables.

He compares this with his earlier paper on the average number of real roots of a random algebraic equation, Ann. Probab. 14, 702-709 (1986; Zbl 0609.60074), and shows that the number of crossings of the algebraic polynomial of the level  $K$  decreases as  $K$  increases, while for the trigonometric case this remains fixed, with probability 1 as long as  $K^2/n \rightarrow 0$  as  $n \rightarrow \infty$ . He also shows that the results for  $K = 0$  are valid when  $K = o(\sqrt{n})$ .

Reviewer: N.Renganathan

**MSC:**

60H99 Stochastic analysis

Cited in 13 Documents

**Keywords:**

average number of level crossings; random trigonometric polynomials

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