

Limiting distributions and almost sure limit theorems for the normalized maxima of complete and incomplete samples from Gaussian sequence

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Abstract

Let $\{X_k, k \geq 1\}$ be a stationary Gaussian sequence with partial maximum $M_n = \max\{X_k, 1 \leq k \leq n\}$ and sample mean $\overline{X}_n = \sum_{k=1}^n X_k/n$. Suppose that some of the random variables X_1, X_2, \dots can be observed and the others not. Denote by \widetilde{M}_n the maximum of the observed random variables from the set $\{X_1, X_2, \dots, X_n\}$. Under some mild conditions, we prove the joint limiting distribution and the almost sure limit theorem for $(\widetilde{M}_n - \overline{X}_n, \{M_n - \overline{X}_n\})$.

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