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ESTIMATING THE VARIANCE OF THE SELECTED RAYLEIGH POPULATION

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Abstract

Let $\prod_1, \cdots, \prod_k$ be k populations with $\prod_i$ being Rayleigh distributed with unknown scale parameter $b_i; i = 1, \cdots, k$ $(k \geq 2)$. Suppose independent random samples $(X_{i1}, \cdots, X_{in}), i = 1, \cdots, k$ of equal size are drawn from each of k populations and let Y_i denote the sum of the squared observations of the i^{th} sample. The population corresponding to the smallest Y_i is selected. We consider the problem of estimating the variance of the selected population. In this paper, we obtain the uniformly minimum variance unbiased estimator (UMVUE), admissible estimators, Bayes estimator for different prior distributions. Expressions for the risk value of the UMVUE are obtained. Further, the estimators obtained are compared numerically with respect to the bias and mean squared error risk by the method of Monte Carlo simulation.

Key Words : *Selection rule, UMVUE, Admissibility, Scale equivariant estimator, Brewster-Zidek technique, Monte Carlo simulation.*

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