



Preliminary test shrinkage estimator in the exponential distribution under progressively Type-II censoring

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Abstract

In this paper and based on progressively Type-II censored samples, we propose the preliminary test shrinkage estimation (SPTE) for the unknown parameter of the exponential distribution. It is shown that the proposed estimator dominates the corresponding classical estimators in the neighborhood of null hypothesis.

Keywords: Exponential distribution; MSE; Preliminary test shrinkage estimation; Progressively Type-II censoring, Relative efficiency.

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1 Introduction

The progressive Type-II censoring, after starting the life-testing experiment with n units can be described as follows: n units are put on life test at time 0. Immediately following the first failure, R_1 surviving units are removed from the test at random. Then, immediately following the second failure, R_2 surviving units are removed from the test at random. This process continues until, at the time of the m -th failure, all the remaining $R_m = n - R_1 - R_2 - \dots - R_{m-1} - m$ units are removed from the experiment. The R_i 's are fixed prior to study. If $R_1 = R_2 = \dots = R_m = 0$, we have $n = m$ which corresponds to the complete sample situation. If $R_1 = R_2 = \dots = R_{m-1} = 0$, then $R_m = n - m$ which corresponds to the conventional Type-II right censoring scheme. For more details, see Balakrishnan and Aggarwala (2000).

Based on complete, censored and record data, the preliminary test and preliminary test shrinkage estimators have been discussed by some authors in exponential distribution. See for example, Baklizi (2010) and Golam Kibria and Saleh (2010). But these estimators have not been discussed in the literature based on progressively type-II censored data. In this paper, we consider the preliminary test shrinkage estimator for the unknown parameter of the exponential distribution under progressively Type-II censoring.

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