

双参数指数分布型元件并联系统的可靠性的广义置信下限

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A Generalized Lower Confidence Limit for Reliability of Parallel Connection System with Two-parameter Exponential Distribution Components

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- 摘要
- 参考文献
- 相关文章

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摘要 本文对于两个独立双参数指数分布元件组成的并联系统, 基于两个元件的定数截尾数据, 利用Weerahandi给出的广义枢轴量和广义置信区间的概念, 建立了可靠性的广义置信下限, 并从理论上研究了广义置信下限的频率性质. 广义置信下限可以通过数值方法得到, 计算方法是简单直接的. 在小样本情形下, 通过与Bootstrap置信下限的模拟研究, 发现广义置信下限的覆盖率更令人满意.

关键词: 双参数指数分布 并联系统 可靠性 广义置信下限 Bootstrap置信下限

Abstract: Based on type II censored data of the components, a generalized lower confidence limit is constructed for the reliability of parallel connection composed of components with two-parameter exponential distribution, using the concept of a generalized pivot statistic a generalized confidence interval due to Weerahandi. Furthermore, the coverage probability of the generalized lower confidence limit is explored by theory. The generalized lower confidence limit can be obtained by numerical method and the computations are simple and straightforward. For small sample, simulation study shows that compared to the Bootstrap lower confidence limit the coverage probability of the generalized lower confidence limit is more satisfactory.

Key words: two-parameter exponential distribution parallel connection system reliability generalized lower confidence limit Bootstrap lower confidence limit

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