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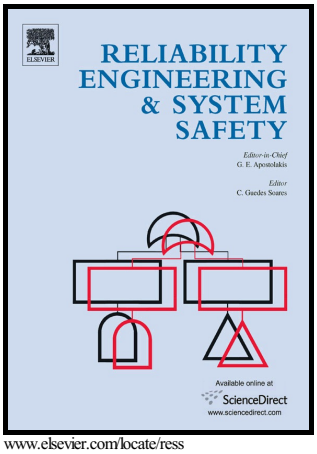

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Planning Two or More Level Constant-Stress Accelerated Life Tests with Competing Risks

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Abstract

In this article, we investigate the optimization problem when the competing risks data come from a progressive type II censoring in an accelerated life test with multiple levels of constant stress. The failure times of the individual causes are assumed to be independent and exponentially distributed with different parameters. We propose three criteria related to the Fisher's information matrix to determine the optimal stress level as well as the optimal sample allocation at each stress level. A real data set is studied to illustrate the application of the proposed criteria.

Keywords: A-optimality; D-optimality; Exponential distribution; Maximum likelihood estimation; Multiple failure modes; Variance-optimality.

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1 Introduction

In reliability analysis, censoring is usually applied to collect lifetime data. Type I censoring and type II censoring are the most two common schemes in the life tests. However, in these two schemes, no test units are allowed to be removed from the tests at the points other than the final termination point. Because of this reason, progressive censoring is arisen to achieve this objective. In addition, it is easy to see that complete sample and type II censoring

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