

# Optimal test plans for multilevel step-stress accelerated life testing with log-normal distribution

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## Abstract

The talk considers optimal times of changing the stress levels in multilevel step-stress accelerated life testing experiments. The lifetime of a single unit under investigation is assumed to follow a log-normal distribution with log-link relation between its mean and the stress factor and common shape parameter on all levels. The effect of changing the stress level on the failure times is modeled by the cumulative exposure assumption. Several optimal criteria are suggested by exploiting the properties of the Fisher information and asymptotic covariance matrix, which elements are derived in a closed-form expressions. A simulation study is performed to compare the proposed optimal procedures in the simple step-stress design (with only two levels) versus the multilevel case. Further, the optimal test plans are applied to a real data example obtained from lithium-ion battery experiments.

## References

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