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STRESS-STRENGTH RELIABILITY ASSESSMENT FOR TOPP-LEONE DISTRIBUTION WITH PROGRESSIVE TYPE-II CENSORED DATA

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SUMMARY

The study aims to estimate stress strength reliability, denoted as $P = P(X > Y)$, where X and Y represent a system's strength and stress parameters, using progressively type-II censoring. Maximum likelihood estimation is used to obtain estimates of stress strength reliability and asymptotic confidence intervals for different parameters and censoring schemes. Bootstrapped confidence intervals (boot-p and boot-t) are also calculated for the same purpose. The Bayesian approach is explored, utilizing Lindley's and Gibbs's sampling methods to obtain Bayes's reliability estimates. Additionally, Bayesian credible intervals and highest posterior density credible intervals are constructed. The accuracy of the various estimates is evaluated through a comprehensive simulation study. Finally, a real data study is presented to validate the proposed methodology further.

Keywords and phrases: Progressive Type-II censoring; Topp-Leone distribution; stress-strength reliability; Bayesian estimation; ML estimation; Gibbs sampling; Lindley's approximation; Monte Carlo simulation.

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