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Identifiability issues in dynamic stress–strength modeling

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Abstract In many real-life scenarios, system reliability depends on dynamic stress–strength interference, where strength degrades and stress accumulates concurrently over time. In some other cases, shocks appear at random time points, causing damage which is only effective at the instant of shock arrival. In this paper, we consider the identifiability problem of a system under deterministic strength degradation and stochastic damage due to shocks arriving according to a homogeneous Poisson process. We provide conditions under which the models are identifiable with respect to lifetime data only. We also consider current status data and suggest to collect additional information and discuss the issues of model identifiability under different data configurations.

Keywords Poisson process · Cumulative damage · Identifiability · Strength degradation · Current status data · Shock arrival process

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