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PRESERVATION OF SOME NEW PARTIAL ORDERINGS UNDER POISSON AND CUMULATIVE DAMAGE SHOCK MODELS

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Abstract: Suppose each of the two devices is subjected to shocks occurring randomly as events in a Poisson process with constant intensity λ . Let \bar{P}_k denote the probability that the first device will survive the k shocks and \bar{Q}_k denote such a probability for second device. Let $\bar{F}(t)$ and $\bar{G}(t)$ denote the survival functions of the first and second device respectively. In this paper we show that some new partial ordering, namely dual (D), dual stochastic (DST), dual weak likelihood ratio (DWLR), increasing failure rate (IFR), dual mean residual lives (DMRL) and dual convex (DCX) orderings between the shock survival probabilities \bar{P}_k and \bar{Q}_k are preserved by the corresponding survival function $\bar{F}(t)$ and $\bar{G}(t)$. We also obtain sufficient condition under which the above mentioned relations between the discrete distributions are verified in some cumulative damage shock models.

Key words: Stochastic order, Dual stochastic order, Dual weak likelihood order, Increasing failure rate, Dual mean residual lives, Dual convex, Shock models

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