Min(max-psd) and max(min-psd) distributions as alifetime distributions in network's reliability

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In our paper we describe the corresponding dynamic mathematical models to perform a comparative analysis of the reliability of two types of networks: serial-parallel and parallel-serial when the number of sub-networks is constant and the number of units in each sub-network are Power Series Distributed (PSD) random variables (r.v.), but also when the lifetimes are independent, identically distributed r.v. We shows that the lifetime distributions of the such kind of networks leeds us to the two new families of distributions called Min(Max-PSD) and Max(Min-PSD) distributions. The formulas for calculating the reliability of the related networks it was deduced to. Sufficient conditions have been formulated for the serial-parallel network to always be more reliable than the parallel-serial network. Some examples have been illustrated graphically.

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