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Reliability Analysis for T² Hotelling Chart Using Piña Decomposition Method

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Abstract: Since T² Hotelling chart uses the Mahalanobis Distance (MD), and because MD is always positive, the covariance matrix estimated in phase I is considered to be constant, the sample size n is representative (n>100), and MD is modeled by the multivariate normal distribution function (MND). When MD represents the variable behavior through the time, and by considering the variance contribution to be constant, and the upper limit of MD of the T² Hotelling chart as the expected mean value, the reliability indexes for each element is estimated. In order to show numerically the proposed method, it was applied to a set of three variables.

Keywords: T2 Hotelling chart, Mahalanobis distance, Decomposition method, Reliability analysis