THE APPROXIMATE TOLERANCE LIMITS FOR $\widehat{C}_p$ CAPABILITY CHART BASED ON RANGE USING α -CUTS TRAPEZOIDAL FUZZY NUMBERS

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ABSTRACT

Process Capability Indices (PCI) is widely used to determine whether the production process can produce product within the specified limits. Different methods have been carried out in order to estimate process capability in the literature. Most of the estimated capability indices are based on the assumptions of simple sample of observation from normally distributed process, which is in control and may give incorrect conclusions when the estimator using simple sample. So, here several small subsamples to make decision regarding the process capability and distribution of estimated with sub grouping are taken for consideration. Patnaik's approximation of chi-square sampling distribution of the $\hat{C}_p$ is used to assess the process performance. To improve the process performance, the fuzzy trapezoidal number estimation of tolerance limits for $\hat{C}_p$ capability chart based on range using α –cuts is constructed. An application is also presented and the flexibility of control limits is increased.

KEYWORDS: Range Tolerance Limits, Range α –Cuts Charts, Trapezoidal Fuzzy Process Capability Chart, Trapezoidal Fuzzy Range Chart