

Measuring process capability index Cpmk with fuzzy data and compare it with other fuzzy process capability indices

ABSTRACT

The index Cpmk is a well-known loss-based process capability index. It can reveal more information about the location of the process mean compared with other classic process capability indices. This index is also more sensitive than other capability indices to any deviations from process mean. When there are some uncertainties in observations, fuzzy logic can be employed to manage these uncertainties. There is some research on different fuzzy process capability indices and this paper is an extension of Tsai and Chen (2006), Chen, Lin, and Chen (2003) for the process capability index Cpmk of fuzzy numbers. In order to find the membership function of process capability index Cpmk, the α -cuts of the fuzzy observation were employed. An example of fuzzy process capability Cpmk calculator was illustrated and compared with other classic fuzzy process capability indices Cp,Cpl,Cpu,Cpk and Cpm . Results showed that fuzzy Cpmk has the advantages of both Cpk and Cpm . Since the index Cpmk is a more sensitive index compared with other classic indices, the fuzzy process capability index Cpmk can be a more sensitive fuzzy index compared with Cp,Cpl,Cpu,Cpk and Cpm.

Keyword: Fuzzy data; Fuzzy process capability indices; Index Cpmk; Process capability indices