A VARIANCE ANALYSIS BY AN ADAPTIVE MAXIMUM LIKELIHOOD APPROACH

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SUMMARY

This paper is focused on a method based on variance analysis using a mixed model and quality control data. For this purpose, statistic models, so called analysis of variances (ANOVA) are widely used to estimate variances of experiment data, provided from a real measurement process. It is based on an experiment plan as defined in the international organization for standardization (ISO 5725-2 standard) with a recommended new version to improve the computational procedure via a new concept based on a mixed model; by combining the deterministic and the statistic statement of the measurement process. The objective of this work is to develop and implement a mixed model based on the recursive least square (RLS) algorithm together with the residual maximum likelihood estimation (REML) and a new adaptive form of REML technique; using quality control data from an accredited laboratory for agro-industry. The novelty here is to use a sliding window strategy that is based on a computational technique considering a subset of the time series elements rather than the whole data. This window advances consecutively, keeping the same number of elements in the window as it moves along the time series data.

Keywords and phrases: Mixed model; Residual Maximum Likelihood; Recursive Least Square and ANOVA methods; Quality Control and Proficiency testing.

2020 Mathematics Subject Classification: 35Q99, 93E24, 15A09.