

Sensitivity analysis in mixed models

Eva Fišerová

Palacký University Olomouc, Czech Republic

Abstract

Statistical models for experiments in geodesy, biology, environmental research, etc. usually involve unknown parameters not only in a regression function but also in a covariance matrix (variance components). For measurement it is used two or more different measurement devices. Since it is not known whether precision of measurement specified in certificates is true, the variance components must be estimated, e.g. by minimum norm quadratic unbiased estimator (MINQUE) [1, 3], and plug-in estimators for the regression parameters can be used. To find statistical properties of plug-in estimators is rather difficult. In some cases the sensitivity approach can be used. If we know that the true value of the variance components is with sufficiently high probability in so-called insensitivity region, then the plug-in estimator is almost the best linear unbiased estimator [2]. Consequently, approximations of variance components can destroy the optimum quality of statistical inference, e.g. confidence and significance levels, what can also be analyzed by sensitivity approach. In the contribution the sensitivity analysis will be applied on geodetical example.

Keywords

Plug-in estimator, Insensitivity region, Variance components, MINQUE.

References

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