

Variance Components and Nonlinearity^{*}

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(Received January 12, 2006)

Abstract

Unknown parameters of the covariance matrix (variance components) of the observation vector in regression models are an unpleasant obstacle in a construction of the best estimator of the unknown parameters of the mean value of the observation vector. Estimators of variance components must be utilized and then it is difficult to obtain the distribution of the estimators of the mean value parameters. The situation is more complicated in the case of nonlinearity of the regression model. The aim of the paper is to contribute to a solution of the mentioned problem.

Key words: Variance components; nonlinear regression model; linearization region; insensitiveness region.

2000 Mathematics Subject Classification: 62F10, 62J05

1 Introduction

The regression model is assumed to be of the form

$$\mathbf{Y} \sim_n \left(\mathbf{f}(\boldsymbol{\beta}), \sum_{i=1}^p \vartheta_i \mathbf{V}_i \right),$$

^{*}Supported by the Council of the Czech Government MSM 6 198 959 214.