

Inference in models with COBS: strictly associated models and models with cross nesting

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Abstract

Orthogonal Block Structures play an important role in experimental designs. In such models the covariance matrix of the observations vector is a linear combination of orthogonal projection known matrices.

In this work we will consider a particular class of this models, Commutative Orthogonal Block Structures (COBS), where a given orthogonal projection matrix that spans the mean vector of the observations vector commutes with the orthogonal projection known matrices.

For the treatment of such models we will use commutative Jordan algebras.

With the use of pivot variables we will show how to produce inference in such models in two sub-classes of such models: strictly associated models and cross-nesting. For those cases we will deduce the UMVUE for the parameters of interest. Experiments will be presented in order to demonstrate its use.

Keywords

Commutative orthogonal block structures (COBS), Strictly associated models, Cross-nesting, UMVUE, Mixed models, Variance components.

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