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On estimation in hierarchical models with block circular covariance structures

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Abstract Hierarchical linear models with a block circular covariance structure are considered. Sufficient conditions for obtaining explicit and unique estimators for the variance–covariance components are derived. Different restricted models are discussed and maximum likelihood estimators are presented. The theory is illustrated through covariance matrices of small sizes and a real-life example.

Keywords Circular block symmetry · Estimation · Identifiability · Maximum likelihood estimator · Restricted model · Variance components