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Estimation and testing of covariance matrices belonging to quadratic subspaces

Abstract:

The aim of the Ph. D. dissertation is to propose tests for covariance structures in doubly multivariate models. Due to the hierarchical nature of the considered experiments, block matrices are appropriate structures. The work considers block structures belonging to the quadratic subspaces. The proposed tests include the likelihood ratio test, the Rao score test and the Wald test. The mentioned tests are compared with each other in terms of the speed of convergence to the limiting chi-square distribution and the power. For the comparison simulation methods were used. Moreover, since the maximum likelihood estimators of unknown parameters have an important role in each considered test, the work shows that these estimators can be obtained by projecting onto an appropriate quadratic subspace. Presented results are illustrated using real data example.

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