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FAKULTÄT
FÜR MATHEMATIK, INFORMATIK
UND NATURWISSENSCHAFTEN

Kolloquium über Mathematische Statistik und Stochastische Prozesse

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Nonparametric tests for large covariance matrices

Abstract:

We consider the detection problem of correlations in a p-dimensional Gaussian vector, when we observe n independent, identically distributed random vectors, for n and p large. We assume that the covariance matrix varies in some ellipsoid with parameter $> 3/2$ and total energy bounded by $L > 0$. We propose a test procedure based on a U-statistic of order 2 which is weighted in an optimal way. We obtain the asymptotic and the sharp asymptotically minimax separation rate. We deduce rate asymptotic minimax results for testing the inverse of the covariance matrix. We construct an adaptive test procedure with respect to the parameter and show that a loss due to adaptation occurs. (Joint work with R. Zgheib)

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