

Sample correlation matrices in high-dimensional framework

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We study the τ -coherence of a $(n \times p)$ -observation matrix in a Gaussian framework where both n and p are large and $p \gg n$.

The τ -coherence is defined as the largest magnitude, outside a band of size $\tau = \tau(n)$, of the empirical correlation coefficients associated to the observations.

Using the Chen-Stein method we show the convergence of the normalized coherence towards a Gumbel distribution. We broaden previous results by considering a 3-regime band structure for the off diagonal covariance matrix. We introduce an hypothesis test for the covariance structure where we study the behaviour under some identifiable alternative.

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