

A Note on Central Limit Theorems for Linear Spectral Statistics of Large Dimensional F -matrix

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Sample covariance matrix and multivariate F -matrix play important roles in multivariate statistical analysis. The central limit theorems (CLT) of linear spectral statistics (LSS) associated with these matrices were established, which received considerable attentions and have been applied to solve many large dimensional statistical problems. However, the sample covariance matrices are not centralized and there exist some questions about CLT defined by the centralized sample covariance matrices. In this note, we shall provide some short complements on the CLT of simplified sample covariance matrix and simplified F matrix, and show that the results remain valid for the centralized sample covariance matrix and centralized F matrix, provided that the ratios of dimension p to sample sizes (n, n_1, n_2) are redefined as $p/(n-1)$ and $p/(n_i-1)$, $i=1, 2$, respectively.

Key Words: Linear spectral statistics, central limit theorem, centralized F -matrix, simplified F -matrix