



THE UNIVERSITY OF
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Department of Statistics

DISSERTATION PROPOSAL

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Gaussian Approximation for High-Dimensional Time Series

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ABSTRACT

The problem considered is approximating sums of high-dimensional stationary time series by Gaussian vectors, using the framework of functional dependence measure. The validity of the Gaussian approximation depends on the sample size n , the dimension p , the moment condition and the dependence of the underlying processes. An example is taken to appreciate the optimality of the allowed dimension p . The Gaussian approximation result can be applied to simultaneous inference of covariances. A simulation study indicates the quality of Gaussian approximation with different n, p under different moment and dependence conditions.

In the future, an estimator for long-run covariance matrices and its convergence rate will be studied. Based on that, it allows constructing simultaneous confidence intervals for mean vectors of high-dimensional time series with asymptotically correct coverage probabilities. A Gaussian multiplier bootstrap method will be proposed.