



The University of Chicago
Department of Statistics

MASTER'S THESIS PRESENTATION

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**Checking Patterns in Residual Series
with the Spectral Analysis**

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110 Eckhart Hall, 5734 S. University Avenue

ABSTRACT

In examining the adequacy of the model established on time series data, diagnostics of serial dependencies among residuals plays a crucial role. Many models in time domain analysis such as Autoregressive Moving Average—Generalized Autoregressive Conditional Heteroskedasticity (ARMA-GARCH) model are assumed to be appropriate when it shows no evident serial correlation in correlogram of residual series and squared residual series. However, the presence of periodic dependencies in residual series may not be well captured with correlogram of the series. Here, focused on data analysis and applications, the spectral analysis approach is explored as a way to disclose hidden correlation structures in residual series. In more detail, the concept and the method of spectral analysis including spectral envelope methodology and its extension to real-valued time series are briefly introduced. Several examples are used to illustrate the application of these methodologies.

Information about building access for persons with disabilities may be obtained in advance by calling Sandra Romero at 773.702-0541 or by email (sandra@galton.uchicago.edu).