



The University of Chicago  
Department of Statistics

## PhD Dissertation Proposal Presentation

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### **Second Order Inference for Nonstationary Time Series and Asymptotic Distributions of Wald Statistics**

**WEDNESDAY, November 11, 2009, at 10:30 AM  
110 Eckhart Hall, 5734 S. University Avenue**

#### **Abstract 1:**

We first introduce a general causal representation for nonstationary time series, under which we discuss the estimation of the covariance matrices for linear models with nonstationary errors. Following the influential work of Andrews (1991) for the random design case, we obtain convergence rates in terms of mean square error for the non-random designs.

An important special case of the general framework is the so called locally stationary processes (Draghicescu, Guillas, and Wu, 2008). We address three problems under this setting. (i) Estimation of the time varying covariance functions and asymptotic distributions of the estimates. (ii) Estimation of the auto-covariance matrices and the consistency in terms of the operator norm. (iii) Estimation of the time varying spectra and their asymptotics.

#### **Abstract 2:**

To test the collapsibility in a three-way contingency table, the null hypothesis constraints the product of two parameters to be zero. Glonek (1992) showed that the standard asymptotic theory for the Wald statistic fails due to the irregularity of the parameter space, and found the right asymptotic distribution. Simulations provide strong evidence that his result may be generalized. We present a partial extension, and discuss some future work.