



The University of Chicago  
Department of Statistics

Seminar Series

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**Asymptotic Expansions Under Weak Dependence  
and Applications to Time Series**

**MONDAY, June 1, 2009, at 4:00 PM**  
**133 Eckhart Hall, 5734 S. University Avenue**  
*Refreshments following the seminar in Eckhart 110.*

**ABSTRACT**

Consider a sequence of strongly mixing random vectors and call a Borel measurable function of a subseries of these random vectors a “block variable”. Many of the inference procedures for weakly dependent observations are based on functions of block variables. Some common examples are:

- (i) Studentized statistics under dependence
- (ii) estimation of the spectral density
- (iii) various types of Block Bootstrap methods,
- (iv) Block Empirical Likelihood methods, etc.

In this talk, we develop Edgeworth Expansion theory for sums of block variables, and apply it to study higher order properties of such inference procedures. While the existing theory of Edgeworth expansions can handle functions of finitely many sample means, the theory presented here can handle an unbounded number of sample means that increases to infinity with the sample size. This is particularly important in the dependent case, as most inference procedures under dependence (including (i)–(iv) above) involve estimation of the dependence structure over an unbounded number of lags.

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