



THE UNIVERSITY OF  
**CHICAGO**

Department of Statistics

STATISTICS COLLOQUIUM

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RAINIER DAHLHAUS

Department of Statistics  
University of Heidelberg

Volatility Decomposition and Online Volatility-Estimation with  
Nonlinear Market Microstructure Noise Models

MONDAY, May 5, 2014, at 4:00 PM  
Eckhart 133, 5734 S. University Avenue  
*Refreshments following the seminar in Eckhart 110.*

ABSTRACT

A technique for online estimation of spot volatility for high-frequency data is developed. The method uses a price model with time shift in combination with a nonlinear market microstructure noise model. A benefit of the model is that it leads to an identifiable decomposition of spot volatility into spot volatility per transaction and the trading intensity, thus highlighting the influence of trading intensity on volatility. The online algorithm uses a computationally efficient particle filter. It works directly on the transaction data and updates the volatility estimate immediately after the occurrence of a new transaction. It also allows for the approximation of the unknown efficient prices. For volatility estimation a nonparametric recursive EM algorithm is used. We neither assume that the transaction times are equidistant nor do we use interpolated prices. For the theoretical investigations of the estimates we present a theoretical framework with infill asymptotics. Joint work with Jan C. Neddermeyer and Sophon Tunyavetchakit.