

Master's Seminar banner

## **"Determining Integrated Volatility of a Diffusion Process, in the Presence of Round-off Errors"**

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WEDNESDAY, March 9, 2005 at 4:18 pm  
Eckhart Hall, Room 110, 5734 S. University Avenue

### **ABSTRACT**

For a simple diffusion process  $X = \sigma W$ , where  $W$  is a standard Brownian motion, the integrated volatility over one time period  $[0,1]$  (which is simply  $\sigma^2$  in this case) is usually estimated by the sum of squared differences of adjacent observations. It is justified by theoretical results that this estimator can be arbitrarily close to the true parameter if we observe the process at sufficiently high frequency. But in practical situations, not only we observe the process at discrete times but also each observation is subject to measurement errors, one of these being the round-off effect. In this case, the "usual" volatility estimator fails.

Theoretical results and simulation results about the asymptotic behavior of this estimator when the observations are subject to round-off errors will be presented. Comparisons to the i.i.d error case will be shown, and future work will be reported.

Results can be extended to more general diffusion processes.