



UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

Friday, 30 March 2007, 2.00pm

Carslaw 173

**Asymptotic theory for local time density estimation and  
nonparametric cointegrating regression**

**Qiyang Wang**  
(University of Sydney)

**Abstract**

We provide a new asymptotic theory for local time density estimation for a general class of functionals of integrated time series. This result provides a convenient basis for developing an asymptotic theory for nonparametric cointegrating regression and autoregression. Our treatment directly involves the density function of the processes under consideration and avoids Fourier integral representations and Markov process theory which have been used in earlier research on this type of problem. The approach provides results of wide applicability to important practical cases and involves rather simple derivations that should make the limit theory more accessible and useable in econometric applications. Our main result is applied to offer an alternative development of the asymptotic theory for non-parametric estimation of a non-linear cointegrating regression involving non-stationary time series. In place of the framework of null recurrent Markov chains as developed in recent work of Karlsen, Myklebust and Tjøstheim (2007), the direct local time density argument used here more closely resembles conventional nonparametric arguments, making the conditions simpler and more easily verified. This is a joint work with Prof. Peter Phillips in Yale University.

Enquiries about the Statistics Seminar should be directed to  
Rafał Kulik ([rkulik@maths.usyd.edu.au](mailto:rkulik@maths.usyd.edu.au))