UNIVERSITY OF SYDNEY

SCHOOL OF MATHEMATICS AND STATISTICS

Statistics Seminar

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Eastern Avenue Lecture Theater

# Strong near-epoch dependence

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**Abstract**

We introduce a new class of dependent sequences of random variables, which is a subclass of near-epoch dependent (NED) sequence, but can also be approximated by mixing sequences. We call them strong near-epoch dependent sequence. Many important econometric models, such as linear processes, a sort of popular nonlinear models defined by nonlinear difference equations, ARMA model, GARCH model etc., are strong NED under usual conditions.

Under dependence conditions substantially weaker than that for NED sequences, we show a $p$-order, $p > 2$ (maximum) moment inequality for strong NED sequences. Then, using this inequality, we derive a central limit theorem and a functional central limit theorem and based on these results, we can also obtain limit distributions of many important processes with strong NED innovations, such as linear processes with strong NED innovations. Moreover, we show a result on the variances of partial sums of a strong NED sequence, but it is usually considered as a prior-assumption in discussing the large sample behaviour for an NED sequence.

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