

***ESTIMATING EXTREMELY HIGH QUANTILES AND TAIL
EMPIRICAL PROCESSES OF TAIL DEPENDENT TIME
SERIES UNDER TAIL ADVERSARIAL STABILITY***

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Venue: Room 102, SCMS

Abstract:

We consider the problem of estimating extremely high quantiles of tail dependent time series, which is carried out by extrapolating from an intermediate high quantile using an estimated tail index. For the asymptotic theory, we provide the functional convergence of the tail empirical processes for a general class of tail dependent processes under the recently developed concept of tail adversarial stability. Unlike the usual big-block-small-block argument used with the mixing condition, the asymptotic analysis under the current tail adversarial stability framework takes advantage of an m -dependent tail martingale approximation. The associated central limit theorem for the quantile estimators is also derived. A comparison with results developed under traditional mixing conditions is provided, which suggests that the current tail adversarial stability framework can lead to possibly weaker conditions for processes with an additive or maximal dependence structure.