THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Seminar

Subexponential lower bounds for f-ergodic Markov processes

Prof. Aleksandar Mijatovic

Department of Statistics, University of Warwick

Abstract

In this talk I will describe a criterion for establishing lower bounds on the rate of convergence in f-variation of a continuous-time ergodic Markov process to its invariant measure. The criterion consists of novel super- and submartingale drift conditions for Markov processes. It provides a general approach for proving lower bounds on the tails of the invariant measure and the rate of convergence in f-variation of a Markov process, analogous to the widely used Lyapunov drift conditions for upper bounds. Our key technical innovation, which will be discussed in the talk, produces lower bounds on the tails of the heights and durations of the excursions from bounded sets of a continuous-time Markov process using path-wise arguments.

I will present applications of our theory to elliptic diffusions and Levy-driven stochastic differential equations with known polynomial/stretched exponential upper bounds on their rates of convergence. Our lower bounds match asymptotically the known upper bounds for these classes of models, thus establishing their rate of convergence to stationarity. The generality of our approach suggests that, analogous to the Lyapunov drift conditions for upper bounds, our methods can be expected to find applications in many other settings. This is joint work with Miha Brešar at Warwick.

Date:	May 7, 2025 (Wednesday)
Time:	3:00 – 4:00 pm
Venue:	Rm 210, Run Run Shaw Building, HKU

All are welcome