ZHONGWEI SHEN, University of Alberta
Long transient dynamics in stochastic systems

Transient dynamics, often observed in multi-scale systems, are roughly defined to be the interesting dynamical behaviours that display over finite time periods. For a class of randomly perturbed dynamical systems that arise in chemical reactions and population dynamics, and that exhibit persistence dynamics over finite time periods and extinction dynamics in the long run, we use quasi-stationary distributions (QSDs) to rigorously capture the transient states governing the long transient dynamics. We study the noise-vanishing concentration of the QSDs to gain information about the transient states and investigate the dynamics near transient states to understand the transient dynamical behaviours as well as the global multiscale dynamics.