北京师范大学随机分析研讨交流会

地点：北师大珠海校区国际交流中心第7会议室

2020年11月13日周五）			
14:00	京华苑大酒店报到（珠海市香洲区唐家湾镇金凤路20号）		
18:00-19:00	晚餐		
2020年11月14日（周六）			
报告时间	**报告人**	**报告题目**	**主持人**
08:30-09:05	鲍建海	Existence of invariant probability measures for McKean-Vlasov SDEs with memory	洪文明
09:05-09:30	胡杉杉	Long-time behaviours of the solution to DDSDEs under the local Lipschitz condition	
09:30-09:55	陈舒凯	Ergodic and strong Feller properties of affine processes	
09:55-10:20	中场休息及交流		
10:20-10:55	张余辉	Integral-type functionals for three Q-processes	鲍建海
10:55-11:20	王婧	Additive functionals for discrete-time single death chains	
11:20-11:45	王珅	Large deviations for additive functionals of distribution dependent SDEs	
12:00-13:00	午餐		
报告时间	**报告人**	**报告题目**	**主持人**
14:00-14:35	何辉	Gromov-Hausdorff-Prokhorov convergence of vertex cut-trees of n-leaf Galton-Watson trees	邵井海
14:35-15:10	黎怀谦	Weak (1,1) boundedness of square functions for Dunkl operators	
15:10-15:35	张树雄	On large deviation probabilities for empirical distribution of the branching random walk with heavy tails	
15:35-16:00	中场休息及交流		
16:00-16:35	黄兴	McKean-Vlasov SDEs with Drifts Discontinuous under Wasserstein Distance	毛永华
16:35-17:00	田陶然	Optimal stopping problem for jump-diffusion processes with regime-switching	
17:00-17:25	闫艳艳	Estimates of spectral gap for CTMC & Recurrence criteria of SDPs	
17:25-17:50	王涛	Convergence Rates in Strong Ergodicity by Hitting Times and L^2-exponential Convergence Rates	
18:00-19:00	晚餐		

Existence of invariant probability measures for McKean-Vlasov SDEs with memory

Jianhai BAO *Tianjin University, Professor*

Abstract: In this talk, we in the first place overview the existing methods to investigate existence of invariant probability measure for McKean-Vlasov SDEs, and then apply the fixed-point theorem of Kakutani for multivalued maps to study existence of invariant probability measures for McKean-Vlasov SDEs with memory.

Long-time behaviours of the solution to DDSDEs under the local Lipschitz condition

Shanshan **HU** *Tianjin University, PHD student*

Abstract: By a truncation procedure, we construct a sequence of equations with a unique solution and show that $X_t^(n)_{0\leq t\leq T}$ converges in probability to some adapted process $X_{t0\leq t\leq T}$. We prove that $X_{t0\leq t\leq T}$ is the solution of DDSDEs under the local Lipschitz condition. Besides, by using the measure dependent Lyapunov functions V, we prove the moment exponential stability of distribution dependent SDEs. One of the tools used in the proofs is the derivative with respect to measure due to Lions. Finally, sufficient conditions are given for the existence and uniqueness of the invariant probability measure.

Ergodic and strong Feller properties of affine processes

Shukai CHEN *Beijing Normal University, PHD student*

Abstract: For general (1+1)-affine Markov processes, we prove the ergodicity and exponential ergodicity in total variation distances. Our methods follow the arguments of ergodic properties for Lévy-driven OU-processes and a coupling of CBI-processes constructed by stochastic equations driven by time-space noises. Then the strong Feller property is considered.

Integral-type functionals for three Q-processes

Yuhui ZHANG *Beijing Normal University, Professor*

Abstract: In this talk, I will introduce some recent results on integral-type functionals for some Q-processes with their application, including two classic non-symmetrizable processes (single birth process and single death one) and birth-death (symmetrizable) processes on trees.

Additive functionals for discrete-time single death chains

Jing WANG *Beijing Normal University, PHD student*

Abstract: In this talk, we disscuss additive functionals for discrete-time single death chains, we get an explicit and recursive representation for high order moments of additive functionals for discrete-time single death chains. Meanwhile, the polynomial convergence and a central limit theorem are investigated. The talk is based on a joint paper with Jiameng TIAN and professor Yuhui ZHANG.

Large deviations for additive functionals of distribution dependent SDEs

Shen WANG *Tianjin University, PHD student*

Abstract: We establish large deviations for additive functionals of several different models of distribution dependent SDEs, by comparing the original equations with the corresponding distribution independent ones.

Gromov-Hausdorff-Prokhorov convergence of vertex cut-trees of n-leaf Galton-Watson trees

Hui HE *Beijing Normal University, Associate Professor*

Abstract: We study the vertex cut-trees of Galton-Watson trees conditioned to have n leaves. This notion is a slight variation of Dieuleveuts vertex cut-tree of Galton-Watson trees conditioned to have n vertices. Our main result is a joint Gromov-Hausdorff-Prokhorov convergence in the finite variance case of the Galton-Watson tree and its vertex cut-tree to Bertoin and Miermonts joint distribution of the Brownian CRT and its cut-tree. The methods also apply to the infinite variance case, but the problem to strengthen Dieuleveuts and Bertoin and Miermonts Gromov-Prokhorov convergence to Gromov-Hausdorff-Prokhorov remains open for their models conditioned to have n vertices. This is a joint work with Matthias Winkel.

Weak (1,1) boundedness of square functions for Dunkl operators

Huaiqian LI *Tianjin University, Associate Professor*

Abstract: We will talk about square functions for the Dunkl heat flow generated by the Dunkl operator and the proof on weak (1,1) boundedness. Related problems will be mentioned.

On large deviation probabilities for empirical distribution of the branching random walk with heavy tails

Shuxiong ZHANG *Beijing Normal University, PHD student*

Abstract: Given a branching random walk $\{Z_n\}_{n\geq 0}$ on $\mathbb{R}$, let $Z_n(A)$ be the number of particles located in interval A at generation n. It is well known that under some mild conditions, $Z_n(\sqrt{n}A)/Z_n(\mathbb{R})$ converges a.s. to $\nu(A)$ as $n \to \infty$, where ν is the standard Gaussian measure. In this work, we investigate its large deviation probabilities under the condition that the step size or offspring law has heavy tail, i.e. the decay rate of

$$\mathbb{P}(Z_n(\sqrt{n}A)/Z_n(\mathbb{R}) > p),$$

where $p \in (\nu(A), 1)$.

McKean-Vlasov SDEs with drifts discontinuous under wasserstein distance

Xing HUANG *Tianjin University, Lecturer*

Abstract: Existence and uniqueness are proved for McKean-Vlasov type distribution dependent SDEs with singular drifts satisfying an integrability condition in space variable and the Lipschitz condition in distribution variable with respect to W_0 or $W_0 + W_\theta$ for some $\theta \geq 1$, where W_0 is the total variation distance and W_θ is the L^θ-Wasserstein distance. This improves some existing results derived for drifts continuous in the distribution variable with respect to the Wasserstein distance. This is a joint work with Feng-Yu Wang.

Optimal stopping problem for jump-diffusion processes with regime-switching

Taoran TIAN *Tianjin University, PHD student*

Abstract: This paper concerns the optimal stopping problem in an infinite horizon for jump diffusion processes with regime-switching. It is found that the jumps of the studied process have important impact on the existence of the optimal stopping times. In this work, we provide a sufficient condition on the jumps of the process in terms of the gain function to ensure the existence of the optimal stopping times, which is shown to be quite sharp by an illustrative example. Additionally, an explicit representation of the -optimal stopping time is given. In order to characterize the associated value function, we show that it is a unique viscosity solution to a coupled system of Hamilton-Jacobi-Bellman equations. In the meanwhile, we unify two existing definitions of viscosity solutions for the Hamilton-Jacobi-Bellman equations associated with the regime-switching processes.

Estimates of spectral gap for CTMC and Recurrence criteria of SDPs

Yanyan YAN *Beijing Normal University, PHD student*

Abstract: We know that the exponential L^2-convergence and exponential ergodicity of a Markov process can be characterized by the L^2-spectral gap of its generator or Dirichlet form. Whilst, recurrence of Markov processes is one of three classical problems. In this talk, I will show more explicit bound estimates of spectral gap for the continuous-time Markov chain and these results can also be applied to irreversible Q-processes. Some examples where explicit estimates are obtained will be presented. Additionally, I will also give the sufficient and necessary recurrence criteria of single death processes. This talk is based on joint work with Prof. Yong-Hua MAO and Prof. Yu-Hui ZHANG.

Convergence rates in strong ergodicity by hitting times and L^2-exponential convergence rates.

Tao WANG *Beijing Normal University, PHD student*

Abstract: We obtain a new lower bound for convergence rate in strong ergodicity κ for general Markov processes by hitting time and L^2-exponential convergence rate λ_1. In particular, for stochastically monotone Markov processes, and Feller processes with non-negative jumps, we can really get that $\kappa = \lambda_1$. This is also justified by some concrete models including single death processes, diffusions on manifolds, and SDEs driven by stable processes.