

浙江大学--复旦大学概率统计联合讨论班

时间：2018年6月2日

地点：复旦大学光华东主楼 1501

上午 主持人： 应坚刚 复旦大学

10:00-10:45 杜恺 复旦大学

题目：随机偏微分方程若干实例、理论与问题

11:00-11:45 余迁 华东师范大学

题目：Limit theorems for functionals of two independent Gaussian processes

下午 主持人： 苏中根 浙江大学

14:00-14:45 武伟娜 南京财经大学

题目：Stochastic porous media equation on general measure spaces with increasing Lipschitz nonlinearities

15:00-15:45 赵国焕 中科院

题目：Stochastic differential equations with Singular drifts

随机偏微分方程若干实例、理论与问题

杜恺

本报告主要介绍几个典型的随机偏微分方程实例,包括非线性滤波理论中的 Zakai 方程,与生物演化有关的 Dawson-Watanabe 方程和 Fleming-Viot 方程,以及分叉和交互粒子系统的极限方程。理论方面,本报告将简要介绍线性随机抛物型方程基本理论的发展和一些主要结果,包括弱解理论, L^p 理论,和最近发展的随机 Schauder 理论,另外还将介绍随机反应扩散方程的一些有趣的结果和未解决的问题。

Limit theorems for functionals of two independent Gaussian processes

余迁

Under certain mild conditions, some limit theorems for functionals of two independent Gaussian processes are obtained. The results apply to general Gaussian processes including fractional Brownian motion, sub-fractional Brownian motion and bi-fractional Brownian motion. A new and interesting phenomenon is that, in comparison with the results for fractional Brownian motion, extra randomness appears in the limiting distributions for Gaussian processes with nonstationary increments, say sub-fractional Brownian motion and bi-fractional Brownian. The results are obtained based on the method of moments, in

which Fourier analysis, the chaining argument and a paring technique are employed.

References

[1] J. Song, F. Xu and Q. Yu: Limit theorems for functionals of two independent Gaussian processes. arXiv:1711.10642v2.

Stochastic porous media equation on general measure spaces with increasing Lipschitz nonlinearities

武伟娜

We prove the existence and uniqueness of probabilistically strong solutions to stochastic porous media equations driven by time-dependent multiplicative noise on general measure spaces, and the Laplacian replaced by a negative definite self-adjoint operator L . This talk is based on a joint work with Michael Roekner and Yingchao Xie.

Stochastic differential equations with Singular drifts

赵国焕

In this talk, we discuss the following SDE with singular drift:

$$dX_t = \sigma(X_t)dW_t + b(X_t)dt,$$

where b^i are distributions in some Sobolev space with negative differentiable index or members of some Kato class. We will show that the weak well-posedness can be obtained by using a unified approach. This work improved the results in [1] and [2].

References

- [1] Bass R.F. and Chen Z.Q.: Brownian motion with singular drift. *The Annals of Probability*. **31**(2) (2003), 791-817.
- [2] Flandoli F., Issoglio E. and Russo F.: Multidimensional stochastic differential equations with distributional drift. *Transactions of the American Mathematical Society*. **369**(3), (2017), 1665-1688.
- [3] Zhang, X. and Zhao, G.: Heat kernel and ergodicity of SDEs with distributional drifts. *arXiv:1710.10537*.(2017)