

**The Hong Kong Polytechnic University
Department of Applied Mathematics**

Seminar

**Inverting the Markovian Projection with an Application
to Local Stochastic Volatility Models
by**

**Mr. ZHANG Jiacheng
Princeton University, USA**

Abstract

We study two-dimensional stochastic differential equations (SDEs) of McKean--Vlasov type in which the conditional distribution of the second component of the solution given the first enters the equation for the first component of the solution. Such SDEs arise when one tries to invert the Markovian projection developed by Gyöngy (1986), typically to produce an Itô process with the fixed-time marginal distributions of a given one-dimensional diffusion but richer dynamical features. We prove the strong existence of stationary solutions for these SDEs, as well as their strong uniqueness in an important special case. Variants of the SDEs discussed in this paper enjoy frequent application in the calibration of local stochastic volatility models in finance, despite the very limited theoretical understanding. Joint work with Daniel Lacker (Columbia University) and Mykhaylo Shkolnikov (Princeton University)

**Date: 29 August 2019 (Thursday)
Time: 11:00a.m. - 12:00noon
Venue: TU801, The Hong Kong Polytechnic University**

***** ALL ARE WELCOME *****