QUASI-INVARIANCE OF THE STOCHASTIC FLOW ASSOCIATED TO ITÔ'S SDE WITH SINGULAR TIME-DEPENDENT DRIFT

Dejun LUO *Institute of Applied Mathematics, Academy of Mathematics and Systems Science, Chinese Academy of Sciences, PRC*, E-mail: luodj@amss.ac.cn

Abstract: In this paper we consider the Itô SDE

$$\mathrm{d}X_t = \mathrm{d}W_t + b(t, X_t)\,\mathrm{d}t, \quad X_0 = x \in \mathbb{R}^d,$$

where W_t is a d-dimensional standard Wiener process and the drift coefficient $b : [0,T] \times \mathbb{R}^d \to \mathbb{R}^d$ belongs to $L^q(0,T; L^p(\mathbb{R}^d))$ with $p \geq 2, q > 2$ and $\frac{d}{p} + \frac{2}{q} < 1$. In 2005, Krylov and Röckner (Probab. Theory Related Fields, 2005) proved that the above equation has a unique strong solution X_t. Recently it was shown by Fedrizzi and Flandoli (Stoch. Anal. Appl., 2013) that the solution X_t is indeed a stochastic flow of homeomorphisms on $\mathbb{R}^d$. We prove in this talk that the Lebesgue measure is quasi-invariant under the flow X_t.