

Existence and uniqueness of solutions of stochastic functional differential equations with non-Lipschitz coefficients

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Assuming a local one-sided Lipschitz condition, M.-K. v. Renesse and M. Scheutzow proved in [1] the existence and uniqueness of (local and global) solutions of stochastic functional differential equations with bounded memory $r > 0$ of the type

$$dX(t) = f(X_t)dt + g(X_t)dB(t),$$

where $X_t = \{X(t+u), -r \leq u \leq 0\}$ denotes a $C([-r, 0], \mathbb{R}^d)$ valued stochastic process.

In my master's thesis (supervised by professor M. Scheutzow) I generalized this result by weakening the condition to a local one-sided *non-Lipschitz* condition. The most important technique for the proof consists in generalizing the stochastic Gronwall lemmata of [1].

References

- [1] M.-K. von Renesse and M. Scheutzow, Existence and uniqueness of solutions of stochastic functional differential equations, *Random Oper. Stoch. Equ.* **18** (2010), pp. 267– 284.