

Regularity of SDEs with non-globally Lipschitz continuous coefficients

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In recent work with Arnulf Jentzen and Martin Hutzenthaler we consider regularity of the solution to a stochastic differential equation (SDE) with respect to the initial value. In my talk I will explain why this type of regularity is relevant for proving convergence rates of numerical schemes to SDEs and for proving strong completeness of the SDE.

It is well-known that if the coefficients of a SDE satisfy a monotonicity condition, then the solution process depends (Lipschitz) continuously on the initial value. However, for many interesting SDEs with coefficients that are not globally Lipschitz continuous the monotonicity condition fails. In my talk I will explain the approach we developed to prove regularity with respect to the initial value for equations that do not satisfy the monotonicity condition, and provide examples of SDEs to which our approach can be applied. These results include both SODEs and SPDEs.