

A Numerical Scheme for Solutions of Stochastic Differential Equations with Markovian Switching

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Summary

This talk introduces a numerical scheme for approximating solutions of stochastic differential equations with Markovian switching. Our effort is devoted to designing approximation algorithms with faster convergence rates than the commonly used Euler-Maruyama scheme. In contrast to the existing literature of numerical solutions for stochastic differential equations and Markovian switching stochastic differential equations, a new approach incorporating martingale methods, quadratic variations, and Markovian stopping times is developed. Under suitable conditions, the convergence of the algorithms is established. The rate of convergence is also ascertained. In addition, numerical examples are provided to show the agreement with the theoretical convergence order.

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