A MILSTEIN-TYPE SCHEME WITHOUT LÉVY-AREA TERMS FOR SDES DRIVEN BY FRACTIONAL BROWNIAN MOTION

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Abstract

Recently, several Taylor-type approximation schemes have been proposed for stochastic differential equations (SDEs) driven by a fractional Brownian motion with Hurst parameter $H \in (1/4, 1)$, see e.g. *A.M. Davie, Differential equations driven by rough paths: an approach via discrete approximation, Appl. Math. Res. Express (2007), No. 2* and *P. Friz, N. Victoir, Multidimensional stochastic processes seen as rough paths, Cambridge University Press, to appear.* Since the distribution of the arising iterated integrals is known only in particular cases, the approximation of these integrals is required (as in the case of the classical Taylor schemes for SDEs driven by a standard Brownian motion).

In this talk, we will present a Milstein-type scheme that uses only increments of the driving fractional Brownian motion and show its convergence for $H > 1/3$. Moreover, we also discuss the exact rate of convergence and the asymptotic error distribution of this scheme.

This talk is based on a joint work with A. Deya and S. Tindel (both Université Henri Poincaré, Nancy).

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