

Some aspects of stochastic calculus for the sub-fractional Brownian motion

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Abstract - In this paper we study some properties related to sub-fractional Brownian motion (sfBm) and its corresponding stochastic calculus. By using a fundamental martingale associated to sfBm a Girsanov theorem is obtained. Multiple Wiener-Itô integrals with respect to sfBm are defined by using a canonical pathwise representation as a Wiener integral for a standard Brownian motion associated to it and a transfer idea from the multiple integrals for such a canonical Brownian motion with a new kernel obtained via Erdély-Kober-type deterministic fractional integrals. The chaos form of the corresponding anticipating sub-fractional integral is introduced and a Clark-Ocone representation formula is established. Applications to the sub-fractional Black-Scholes model are provided.

Key words and phrases : sub-fractional Brownian motion, anticipating sub-fractional integral, Girsanov theorem, Clark-Ocone formula, sub-fractional Black-Scholes model

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