

A Clark-Ocone formula in UMD Banach spaces

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Abstract

Let H be a separable real Hilbert space and let $F = (F_t)_{t \in [0, T]}$ be the augmented filtration generated by an H -cylindrical Brownian motion W_H on $[0, T]$ on a probability space (Ω, \mathcal{F}, P) . We prove that if E is a UMD Banach space, $1 \leq p < \infty$, and f in $D^{1,p}(E)$ is F_T -measurable, then $f = E f + \int_0^T P_F(Df) dW_H$ where D is the Malliavin derivative and P_F is the projection onto the F -adapted elements in a suitable Banach space of L^p -stochastically integrable $L(H, E)$ -valued processes.

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