Chaos Expansions, Multiple Wiener-Ito Integrals, and Their Applications

Chaos expansions, multiple Wiener-Ito integrals, and their applications have become a field of considerable interest in applied probability and mathematical physics, and statistics. Divided into four parts, this book features a wide selection of surveys and recent research articles.

The Wiener-Ito chaos expansion is fundamental in stochastic analysis. In particular, it plays a crucial role in the Malliavin calculus. We therefore give a detailed proof. The first version of this theorem was proved by Wiener in 1938. Later Itô (1951) showed

Chaos expansions of double intersection local times of Brownian motion take values. Section contains main results of the paper which are stated in Theorem and Corollary. The proof ... chaos expansion in the $\mathbb{R}^d$-valued case in $\mathbb{C}$. 2. Itô Representation Theorem for Hilbert Space Valued Random Variables

In this paper we study zero-one laws for processes represented as finite sums of stochastic integrals with respect to symmetric infinitely divisible random measures.

The study of chaos expansions and multiple Wiener-Itô integrals has become a field of considerable interest in applied and theoretical areas of probability, stochastic processes, mathematical physics, and statistics. From the isometry of multiple Wiener-Itô integrals, we deduce

Complex Wiener-Itô Chaos Decomposition

We give a formula of expanding the solution of a stochastic differential equation (stochastic integral as well) into a finite sum of Wiener-Itô chaos expansion expansion with explicit residual. And then we apply this formula to obtain several inequalities for diffusions such as Poincaré type inequalities, variance inequalities, and a correlation inequality for Gaussian measures. A simple proof for Malliavin's variance inequality for ... expansion of multiple Wiener-Itô integrals.

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