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On some regularity properties of solutions to stochastic evolution equations in Hilbert spaces. (English) Zbl 0704.60059

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A linear stochastic equation $dX = AXdt + dM$ in a Hilbert space is considered, where M denotes a continuous, square integrable martingale and A is a generator of an analytic semigroup of bounded operators. By a solution to the above equation is meant the so-called mild solution given by the variation of constants formula.

Denote by H_α the space $Dom((\lambda I - A)^{\alpha/2})$, for an appropriately chosen λ, endowed with a graph norm. The main result of the paper describes the regularity of the solution X in the space H_α. If M is a Wiener process then X is shown to be Hölder-continuous in H_α with an exponent smaller than (1- $\alpha)/2$ for any $\alpha \in (0, 1)$. The proof follows from Kolmogorov's test for continuity. The case of cylindrical martingales is also considered.

Reviewer: B.Gołdys

MSC:

60H15 Stochastic partial differential equations (aspects of stochastic analysis)
60G15 Gaussian processes
60G17 Sample path properties

Keywords:

infinite-dimensional Ornstein-Uhlenbeck process; analytic semigroup; maximal regularity; analytic semigroup of bounded operators; mild solution

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