ON WEAK SOLUTIONS OF STOCHASTIC EVOLUTION EQUATIONS WITH UNBOUNDED COEFFICIENTS

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0. Introduction. We shall consider in this paper weak solutions of the following stochastic evolution equation:

$$\begin{cases} dX=[AX+f(X)]dt+g(X)dW , \\ X(0)=x_0,\ 0\le t\le 1 , \end{cases} \tag{1}$$

where A is a generator of C_0-semigroup S(t), t≥0, of bounded operators on a Hilbert space H and W is a cylindrical Wiener process on another Hilbert space K with covariance operator I. It is well-known that if dim H < ∞ then (1) has a global weak solution provided f and g are continuous functions of linear growth. On the other hand, if dim H = ∞ then a solution to (1) need not exist even if g=0 and f is uniformly continuous and bounded and hence some additional assumptions are necessary.

There are not many results on weak solutions to (1) in infinite dimension. In those existing two types of conditions appear. Either it is assumed that A is a coercive operator on some Gelfand triple with compact injections or (loosely speaking) some invertibility property is imposed on g in order to allow the use of the Girsanov transformation. This last assumption is quite restrictive. Recently in [7] an existence result for the equation (1) was proved under the more general assumption that A is a generator of a compact semigroup, and f and g are weakly continuous mappings of linear growth defined on H.

AMS Mathematics Subject Classification: 60H15