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REGULARITY OF MEASURES INDUCED BY SOLUTIONS OF INFINITE DIMENSIONAL STOCHASTIC DIFFERENTIAL EQUATIONS

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ABSTRACT. This paper is concerned with measures induced by solutions of infinite dimensional stochastic differential equations. Necessary and sufficient conditions are obtained for Fomin differentiability and Skorokhod differentiability of a σ-additive set function defined on the Borel field of an abstract Wiener space. Fomin differentiability or Skorokhod differentiability is established for measures associated with large classes of Ito processes. It is shown that under certain assumptions measures induced by such processes satisfy the Kolmogorov forward equation.

1. Introduction. The concept of differentiable measures was introduced by Fomin in 1968. The initial motivation was to extend the theory of generalized functions to infinite dimensional spaces. In this context differentiable measures emerged to be utilized as elements of the space of test functions as well as solutions of the equations corresponding to differential and pseudo-differential operators. Introduction of smooth measures was a successful attempt to bypass obstacles that one encounters in extending the theory of generalized functions to infinite dimensional spaces. As is shown in [**13**], in infinite dimensional spaces, certain distributions which may not be representable by point functions can be represented by set functions which possess certain regularity properties. The difficulties encountered in infinite dimensional spaces arise partly because of the fact that the fundamental volume measure (Lebesgue measure) is not available in such spaces.

In a Euclidean space, with every bounded σ-additive measure is associated its (possibly generalized) density which is a point function.

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