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CONTINUOUS DEPENDENCE ON PARAMETER AND THE KURZWEIL EQUATION ASSOCIATED WITH NON CLASSICAL STOCHASTIC DIFFERENTIAL EQUATION

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ABSTRACT

Continuous dependence on a parameter for the Kurzweil equations associated with the Lipschitz quantum stochastic differential equation is studied. This is accomplished within the framework of [2 and 4] formulations of non classical stochastic differential equation and the Schwabik generalized ordinary differential equations.

KEYWORDS: QSDE, Kurzweil equations and integrals, Functions of bounded variation.

INTRODUCTION

This paper is concerned with the study of the dependence of solution on a parameter for the following stochastic differential equation of non classical type introduced by Ekhaguere in [2]

$$\frac{d}{dt}\langle \eta, X(t)\xi\rangle = P(X(t),t)(\eta,\xi) \tag{1}$$

$X(t_0) = X_0$, $t \in [t_0, T]$, and η, ξ lying in some dense subspaces of some Hilbert spaces.

Equation (1) is a first order non-classical ordinary differential equation with a sesquilinear form valued map P as the right hand side.

In [4], the existence of a solution of a Lipschitzian quantum stochastic differential Equation (1) using the associated Kurzweil (generalized) equations was established along with some numerical approximations. In arriving at these results, assumption of Lipschitz and Caratheodory conditions were made on the map $P(X(t),t)(\eta,\xi)$.

The Kurzweil equation associated with QSDE (1) is of the form

$$\frac{d}{d\tau}\langle \eta, X(\tau)\xi\rangle = DP(X(\tau),t)(\eta,\xi), \quad t \in [t_0, T] \tag{2}$$

The starting point of this investigation is the following Theorem.

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