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EXISTENCE OF SOLUTION FOR ABSTRACT NEUTRAL STOCHASTIC INTEGRODIFFERENTIAL INCLUSIONS IN HILBERT SPACES

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Abstract. In this paper, by using the fractional power of operators and a new fixed point theorem for a condensing map due to Martelli the existence of solution for a class of abstract neutral stochastic integrodifferential inclusions in Hilbert spaces is studied. An example is provided to illustrate the theory.

Keywords. Existence, multivalued map, stochastic Integrodifferential inclusions, neutral, fixed point theorem, Hilbert space.

AMS (MOS) subject classification: 34K40, 34A60, 60H10.

1 Introduction

Random differential and integral inclusions play an important role in characterizing many social, physical, biological and engineering problems. Stochastic differential inclusions are important from the viewpoint of applications since they incorporate (natural) randomness into the mathematical description of the phenomena, and, therefore, provide a more accurate description of it. The global existence results for functional integro-differential stochastic evolution equations in Hilbert space have been studied elaborately in [14]. Taniguchi *et al* [22] established the unique solution of stochastic functional differential equations in Hilbert space using the contraction mapping principle. Recently, global existence of solutions for a semilinear stochastics delay evolution equations with nonlocal conditions have been studied by Balasubramaniam and Ntouyas [6] by using a Leray-Schauder Alternative fixed point approach. The existence, uniqueness, stability, invariant measures and other qualitative behaviors of solutions to differential inclusions have been extensively investigated by many authors. The theory for differential and integral inclusions in deterministic cases may be found in several papers and monographs see (for example [3, 8, 11, 13, 18]). In particular Benchohra and Ntouyas [9] studied existence results for neutral functional differential inclusions. A generalization of differential inclusions to 'stochastic differential inclusions' called multivalued stochastic differential equations are obtained