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SUCCESSIVE APPROXIMATION OF NEUTRAL FUNCTIONAL IMPULSIVE STOCHASTIC DIFFERENTIAL EQUATIONS WITH POISSON JUMPS

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Abstract. In this paper, we investigate the existence and uniqueness of mild solutions for neutral stochastic functional differential equations driven by Poisson jumps with impulse effects. In this work, we use the semigroup theory and successive approximation for obtaining the required results.

Keywords. Stochastic differential equations, Successive approximation, Poisson process, impulse.

AMS (MOS) Subject Classification: 60H15, 34G20, 60J65, 60J75.

1 Introduction

Stochastic differential equations have been investigated as mathematical models to describe the dynamical behavior of a real life phenomena. It is essential to take into account the environmental disturbances as well as the time delay while constructing realistic models in the area of engineering, biology etc. Neutral functional differential equations are used to describe a mathematical model for such systems. Hale and Lunel [1] introduced neutral functional differential equations for the deterministic case and Kolmanovskii and Myshkis[7] introduced neutral stochastic functional differential equations(NSFDEs) and pointed out their applications in aeroelasticity. Since then, for the past few decades various studies on NSFDEs were done by many authors and fruitful results have been achieved in their quantitative and qualitative properties. (see references there in [2,3,4,6,8,11,12]).

Moreover, many practical systems (such as sudden price variations (jumps) due to market crashes, earthquakes, hurricanes, epidemics and so on) may undergo some jump type stochastic perturbations. The sample paths of such systems are not continuous. Therefore, it is more appropriate to consider