



## **NUMERICAL SOLUTION OF STOCHASTIC EPIDEMIOLOGICAL MODEL: CASE OF SIR MODEL**

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### **ABSTRACT**

In this paper we extend the SIR epidemic model, considered in [1], from a deterministic framework to a stochastic one, and we formulate it as a stochastic differential equation. We present a Picard iteration method of proving verification theorem for the existence and uniqueness of the solution in global behavior. As a side effect of this study, we move one the development of the numerical treatment to solve the considered problem using the Milstein's scheme. A comparative numerical study is done using some values of the intensity of the stochastic environment around the endemic equilibrium.

**KEYWORDS:** SIR Model, Numerical Simulation, Stochastic Process, Picard Iteration, Brownian Motion, Stochastic Differential Equation