



Existence and Uniqueness of a Solution of Fisher-KKP Type Reaction Diffusion Equation

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Abstract: In this paper we prove the existence and uniqueness of a strong solution of a Fisher-KKP type reaction diffusion equation with Dirichlet boundary conditions using the method of semidiscretization.

Keywords: *method of semidiscretization; reaction diffusion equation; strong solution; A priori estimate.*

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1 Introduction

In this paper we concerned with the following reaction diffusion equation of KPP-Fisher type with Dirichlet boundary conditions:

$$\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2} + ku(t, x)[1 - u(t, x)] + f(t, x), \quad t \in (0, T], \quad x \in (0, \pi), \quad (1)$$

$$u(x, 0) = u_0(x), \quad x \in (0, \pi), \quad (2)$$

$$u(0, t) = u(\pi, t) = 0, \quad t \in (0, T], \quad (3)$$

where k is a positive constant and $u_0 \in L_2(0, \pi)$.

Since 1930, various classical types of initial boundary value problem have been investigated by many authors using the method of semidiscretization; see for instance [11, 15, 16] and references therein.

The method of semidiscretization in time is a very efficient tool in the study of an approximate solution and its convergence to the solution of the problem. In this

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