

Accepted Manuscript

Minimal wave speed of competitive diffusive systems with time delays

Guo Lin

PII: S0893-9659(17)30277-X
DOI: <http://dx.doi.org/10.1016/j.aml.2017.08.018>
Reference: AML 5326

To appear in: *Applied Mathematics Letters*

Received date: 19 April 2017
Revised date: 27 August 2017
Accepted date: 27 August 2017

Please cite this article as: G. Lin, Minimal wave speed of competitive diffusive systems with time delays, *Appl. Math. Lett.* (2017), <http://dx.doi.org/10.1016/j.aml.2017.08.018>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Minimal Wave Speed of Competitive Diffusive Systems with Time Delays

Guo Lin*[†]

School of Mathematics and Statistics, Lanzhou University,
Lanzhou, Gansu 730000, People's Republic of China

August 27, 2017

Abstract

This paper is concerned with the minimal wave speed of competitive diffusive systems, of which the corresponding wave system is of infinite dimensional. By constructing upper and lower solutions, the existence of traveling wave solutions is confirmed, which shows the minimal wave speed. Therefore, it completes the known results.

Keywords: generalized upper and lower solutions

AMS Subject Classification (2000): 35K57; 35C07; 37C65.

1 Introduction

Traveling wave solutions of parabolic type systems have been widely studied since Fisher [3] and Kolmogorov et al. [4]. In [13, 14, 16], there are some classical backgrounds and earlier results on the traveling wave solutions. To better describe the problem, we first give the definition of traveling wave solutions of the following classical reaction-diffusion system

$$\frac{\partial w(x, t)}{\partial t} = D\Delta w(x, t) + f(w(x, t)), \quad (1.1)$$

where $w(x, t) \in \mathbb{R}^n$, $x \in \mathbb{R}$, $t > 0$, $f : \mathbb{R}^n \rightarrow \mathbb{R}^n$. If there exist $\rho \in C^2(\mathbb{R}, \mathbb{R}^n)$ and $c \in \mathbb{R}$ such that $w(x, t) = \rho(\xi)$, $\xi = x + ct$, is a special solution of (1.1), then (1.1) has a traveling wave solution. Of course, to formulate different phenomena, $\rho(\xi)$ also satisfies proper asymptotic boundary conditions, we call such a solution is a desired traveling wave solution.

*E-mail: ling@lzu.edu.cn.

[†]Supported by NSF of China (Grant No. 11471149, 11731005).

Download English Version:

<https://daneshyari.com/en/article/5471519>

Download Persian Version:

<https://daneshyari.com/article/5471519>

[Daneshyari.com](https://daneshyari.com)