

BI-SPATIAL RANDOM ATTRACTOR FOR STOCHASTIC FITZHUGH–NAGUMO SYSTEMS ON UNBOUNDED THIN DOMAIN

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ABSTRACT. A bi-spatial random attractor is obtained for the stochastic FitzHugh–Nagumo systems on unbounded thin domains when the initial space is $L^2 \times L^2$ and the terminate space is $L^p \times L^2$. Furthermore, we establish the upper semi-continuity of attractors under the p -norm when a family of $(n + 1)$ -dimensional thin domains degenerates into a n -dimensional unbounded domain.

1. Introduction

This paper continues the previous work of the authors (see [27]) concerning the study of the existence and upper semi-continuity of random attractors in $L^2 \times L^2$ for the stochastic FitzHugh–Nagumo systems defined on an unbounded thin domain. Here the aim is to investigate a stronger attraction and convergence of the $L^2 \times L^2$ -attractor of the same systems. More precisely, we will show the existence of a bi-spatial random attractor in $L^p \times L^2$, where $p > 2$. Also, we

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