**THESIS INFORMATION**

Thesis title: **Regularization of some inverse problems in diffusion processes**

Speciality: Analysis of Mathematics

Code: 62460102

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Supervisor: Assoc. Dr. Nguyen Huy Tuan

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1. SUMMARY OF THE THESIS CONTENT:

In this thesis, we investigate in two main chapters (chapter 2 and chapter 3).Chapter 2: Inverse source problem for fractionaldiffusion equation

In this chapter, we consider the problem of finding source function *f*  for the following diffusion model:

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The goal of the topic is to study the problem in the case of noise of  and not necessarily a positive function.

Chapter 3: The inverse problem for the nonlinear diffusion equation with fractional derivative

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The main content of the chapter is to consider the reverse problem, ie to determine  when is known. This chapter contains two main results:

**•** The first result relates to the source function of form:  with  satisfy , for each real number  and .

**•** The second result relates to the source function of the general form with  satisfies  and

,

with constants , not dependent .

2. THE NEW RESULTS OF THE THESIS:

In this thesis, we give the following new results:

Firstly, consider the problem of determining the source function for the diffusion model with fractional derivative. With noisy data , we consider both functions of  to be positive on the interval [0,1] and not necessarily positive. Results of convergence are given in each case.

Secondly, consider the problem of space inverse problem as (2), by appropriate techniques, we propose two regularization methods, the results of the unique existence of the regularize solutions. Convergence errors are provided.

The main results of the thesis have been published in three prestigious international articles (01 SCI and 02 SCIE).

3. THE PROBLEMS NEEDS TO CONTINUE STUDY

In the future we will study the following issues:

1. Continue to study the partial differential equations backward in time with the fractional derivative.

2. Study the partial differential equations with the fractional derivative contain random elements.

3. Study the problem of partial differential equations with some different types of fractional derivatives.

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| **SUPERVISOR****Assoc. Dr. Nguyen Huy Tuan** | **PhD STUDENT****D:\OneDrive\Work\A_Hoan\A Hoan_HoSo_BaoVe_Final_3.9.2019\A_Hoan.jpg****Luu Vu Cam Hoan** |

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