

Fourth International Conference on
Analysis and Applied Mathematics

THE ABSTRACT BOOK
of the conference ICAAM 2018

Edited by
Prof. Dr. Charyyar Ashyralyyev
and
Assoc. Prof. Dr. Evren Hincal

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The conference is organized biannually. Previous conferences were held in Gümüşhane, Turkey in 2012, in Shymkent, Kazakhstan in 2014, and in Almaty, Kazakhstan in 2016. The aim of the International Conference on Analysis and Applied Mathematics (ICAAM) is to bring mathematicians working in the area of analysis and applied mathematics together to share new trends of applications of mathematics. In mathematics, the developments in the field of applied mathematics open new research areas in analysis and vice versa. That is why, we plan to found the conference series to provide a forum for researches and scientists to communicate their recent developments and to present their original results in various fields of analysis and applied mathematics.

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- Analysis
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FOREWORD

The Organizing Committee of ICAAM and Near East University, Lefkosa (Nicosia), Mersin 10, Turkey are pleased to invite you to the Fourth International Conference on Analysis and Applied Mathematics, ICAAM 2018. The meeting will be held on September 6-9, 2018 in North Cyprus, Turkey.

The conference is organized biannually. Previous conferences were held in Gumushane, Turkey in 2012, in Shymkent, Kazakhstan in 2014, and in Almaty, Kazakhstan in 2016. The proceedings of ICAAM 2012, ICAAM 2014, and ICAAM 2016 were published in AIP (American Institute of Physics) Conference Proceedings. Near East University is pleased to host the fourth conference which is focused on various topics of analysis and its applications, applied mathematics and modeling.

The conference will consist of plenary lectures, mini symposiums and contributed oral presentations.

The proceedings of ICAAM 2018 published in AIP (American Institute of Physics) Conference Proceedings.

Selected full papers of this conference will be published in peer-reviewed journals.

The aim of the International Conference on Analysis and Applied Mathematics (ICAAM) is to bring mathematicians working in the area of analysis and applied mathematics together to share new trends of applications of mathematics. In mathematics, the developments in the field of applied mathematics open new research areas in analysis and vice versa. That is why, we plan to found the conference series to provide a forum for researches and scientists to communicate their recent developments and to present their original results in various fields of analysis and applied mathematics. The Conference Organizing Committee would like to thank our sponsors. The main organizer of the conference is Near East University, Lefkosa (Nicosia), Mersin 10, Turkey. The conference is also supported by Institute of Mathematics and Mathematical Modeling, Almaty, Kazakhstan. We would like to thank Near East University, Turkey and Institute of Mathematics and Mathematical Modeling, Kazakhstan for their support. We also would like to thank to all Invited Speakers, Co-Chairs, Coordinating Committee, International Organizing Committee, International Organizing Committee, and Technical Program Committee Members. With our best wishes and warm regards,

Chairs:

Prof. Allaberen Ashyralyev

Prof. Tynysbek Kalmenov

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An inverse problem of heat conduction in a degenerating domain

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Abstract: This report is devoted to an inverse problem of finding a source parameter $\lambda(t)$ and $u(x, t)$ in following heat equation:

$$(1) \quad u_t(x, t) = u_{xx}(x, t) - \lambda(t)u(x, t), \quad 0 < x < t, t > 0,$$

with homogeneous initial condition

$$(2) \quad u(x, 0) = 0,$$

and the boundary condition

$$(3) \quad u(x, t)|_{x=0} = 0, \quad u(x, t)|_{x=t} = 0,$$

subject to the overspecification

$$(4) \quad \int_0^t u(x, t)dx = E(t), \quad E(0) = 0,$$

where the function $E(t)$ is given.

In this paper we found a nontrivial solution of the inverse problem for the heat equation in a degenerate domain that satisfies the integral condition (4) and found the lambda parameter. It was also shown that the found nontrivial solution is a bounded function for $\forall t > 0$.

Throughout this note we mainly use techniques from our works [1], [2].

Keywords: An inverse problem, heat equation, degenerating domain, integral condition.

2010 Mathematics Subject Classification: 35J05, 35J08, 35J25

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- [1] M.M. Amangalieva, M.T. Jenaliyev, M.T. Kosmakova, M.I. Ramazanov, On the boundary value problem of heat conduction with a free boundary, *Nonclassical equations of mathematical physics*, vol. 2012, 29-44, 2012.
- [2] M.M. Amangalieva, M.T. Jenaliyev, M.T. Kosmakova, M.I. Ramazanov, On a Volterra equation of the second kind with "incompressible" kernel, *Advances in Difference equations*, vol. 2015, number 71, 1-14, 2015.

The Solution of One Dimensional Fractional Hyperbolic Partial Differential Equations Using Sumudu Transform

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Abstract: In this study, we propose a new algorithm to find exact solution of one dimensional hyperbolic partial differential equations. The Sumudu transform method can be used to get exact solutions of one dimensional fractional hyperbolic partial differential equations. The comparison of variational iteration method and these method is presented.

Key Words: Fractional hyperbolic equation; initial boundary value problems; sumudu transform method, iteration method