S A N T I A G O N U M É R I C O III

Noveno Encuentro de Análisis Numérico de Ecuaciones Diferenciales Parciales

Facultad de Matemáticas, Pontificia Universidad Católica de Chile
Santiago, Junio 28 - 30, 2017

PROGRAM

Contents

1 Introduction

The **Noveno Encuentro de Análisis Numérico de Ecuaciones Diferenciales Parciales** has been organized in sequential talks of **45**, **30** and **15** minutes length (40, 25 and 10 minutes for the presentation, respectively, and 5 minutes for questions and comments). All the talks will be given at Auditorium Erika Himmel König of Centro **Mide UC**.

In the following pages, we describe the corresponding program. In case of a multi-authored contribution, the speaker is underlined.

The organizers acknowledge financial support by:

- Centro de Modelamiento Matemático (CMM) de la Universidad de Chile,
- Vicerrectoría de Investigación de la Pontificia Universidad Católica de Chile,
- Facultad de Matemáticas de la Pontificia Universidad Católica de Chile,
- Centro de Investigación en Ingeniería Matemática (CI^2MA) de la Universidad de Concepción.

In addition, we express our recognition and gratitude to all speakers for making **Santiago Numérico III** possible.

Organizing Committee
Jessika Camaño
Gabriel N. Gatica
Norbert Heuer
Ricardo Oyarzúa

Santiago, June 2017

2 Wednesday, June 28

8.30-9.15 REGISTRATION

9.15-9.30 WELCOME SPEECH

[*Chairman*: N. HEUER]

9.30-10.15 Ilona Ambartsumyan, Vince J. Ervin, Truong Nguyen, Ivan Yotov: *A nonlinear Biot-Stokes model for the interaction of a non-Newtonian fluid with a poroelastic medium.*

10.15-10.45 Gabriel Acosta, Juan Pablo Borthagaray, Norbert Heuer: *FE approximations of the nonhomogeneous fractional Dirichlet problem.*

10.45-11.00 Ricardo Oyarzúa, Manuel Solano, Paulo Zúñiga: *A high order mixed-FEM for the Stokes problem on curved domains.*

11.00-11.30 COFFEE BREAK

11.30-12.00 Christopher Feuillade, Carlos Jerez-Hanckes, Elwin van 't Wout: *The low-frequency resonance of acoustic scattering at bubble clouds.*

12.00-12.30 Raimund Bürger, Sudarshan K. Kenettinkara, David Zorío: *Approximate Lax-Wendroff discontinuous Galerkin methods for hyperbolic conservation laws.*

12.30-13.00 Jessika Camaño, Ricardo Oyarzúa, Ricardo Ruiz-Baier, Giordano Tierra: *Error analysis of an augmented mixed method for the Navier-Stokes problem with mixed boundary conditions.*

13.00-15.00 LUNCH

[*Chairman*: C. JEREZ-HANCKES]

15.00-15.45 Tan Bui-Thanh: *The upwind hybridized discontinuous Galerkin (HDG) framework: Theory and application to magnetohydrodynamic and atmospheric applications.*

15.45-16.15 Thomas Führer, Norbert Heuer, Ernst P. Stephan: *On the DPG method for Signorini problems.*

16.15-16.45 Alexis Jawtuschenko, Ariel Lombardi: *A mixed VEM scheme for a problem with edge and vertex singularities.*

16.45-17.15 COFFEE BREAK

17.15-17.30 Felipe Lepe, Salim Meddahi, David Mora, Rodolfo Rodríguez: *Acoustic interaction between dissipative fluids.*

17.30-18.00 Nelson O. Moraga, Roberto C. Cabrales, Marcelo A. Marambio: *Solving unsteady coupled fluid mechanics and convective heat transfer problems by a geometric multigrid finite volume method.*

18.00-18.30 Michael Karkulik: *Variational formulation of time-fractional parabolic equations.*

18.30-19.00 Fernando Henríquez, Carlos Jerez-Hanckes: *Multiple traces formulation and semi-implicit scheme for modeling packed cells under electrical stimulation.*

19.30 WELCOME COCKTAIL

3 Thursday, June 29

[*Chairman*: G. GATICA]

9.30-10.15 Erik Burman: *Stabilized finite element methods for ill-posed problems with conditional stability.*

10.15-10.45 Enrique Otárola: *Optimization with respect to order in a fractional diffusion model: analysis, approximation and algorithmic aspects.*

10.45-11.00 Raimund Bürger, Enrique Fernández-Nieto, Víctor Osores: *Polydisperse sedimentation in inclined channels.*

11.00-11.30 COFFEE BREAK

11.30-12.00 Sergio González-Andrade, Sofía López: *A multigrid approach for a class of quasilinear PDEs arising in optimization problems.*

12.00-12.30 Pedro Merino, Alexander Nenjer: *FEM approximation of sparse optimal control problems with finite–dimensional control space.*

12.30-13.00 Antti Niemi: *Simple triangular shell finite elements based on shell theory.*

13.00-15.00 OFFICIAL PICTURE/LUNCH

[*Chairman*: R. BÜRGER]

15.00-15.45 Martin Costabel, Monique Dauge, Serge Nicaise, Jérôme Tomezyk: *The time-harmonic Maxwell equations with impedance boundary conditions.*

15.45-16.15 Ana Alonso Rodríguez, Francesca Rapetti: *The discrete relations between fields and potentials with high order Whitney forms.*

16.15-16.45 Jérôme Bonelle, Pierre Cantin, Erik Burman, Alexandre Ern: *A compact-stencil scheme on polyhedral meshes for steady transport equations.*

16.45-17.15 COFFEE BREAK

17.15-17.30 Carlos Garcia Vera, Gabriel N. Gatica, Antonio Márquez, Salim Meddahi: *A fully discrete scheme for the pressure-stress formulation of a time-domain fluid-structure interaction problem.*

17.30-18.00 Jessika Camaño, Gabriel N. Gatica, Ricardo Oyarzúa, Ricardo Ruiz-Baier: *An augmented stress-based mixed finite element method for the Navier-Stokes equations with nonlinear viscosity.*

18.00-18.30 Ernesto Cáceres, Gabriel N. Gatica, Filánder A. Sequeira: *A mixed virtual element method for a pseudostress-based formulation of linear elasticity.*

20.30 CONFERENCE DINNER: **Restaurant El Mesón Nerudiano**

4 Friday, June 30

[*Chairman*: R. OYARZÚA]

9.30-10.15 Maxim Olshanskii, Arnold Reusken, Xianmin Xu: *Unfitted finite element methods for PDEs on evolving surfaces.*

10.15-10.45 Gabriel Acosta, Francisco Bersetche, Juan Pablo Borthagaray: *A finite element method for fractional evolution problems.*

10.45-11.00 Sergio Caucao, Gabriel N. Gatica, Ricardo Oyarzúa: *Analysis of an augmented fully-mixed formulation for the non-isothermal Oldroyd–Stokes problem.*

11.00-11.30 COFFEE BREAK

11.30-12.00 Raimund Bürger, Stefan Diehl, M. Carmen Martí, Pep Mulet, Ingmar Nopens, Elena Torfs, Peter A. Vanrolleghem: *A multi-class model for batch settling in WRRFs.*

12.00-12.30 Andrés I. Ávila, Andreas Meister, Martin Steigemann: *An adaptive Galerkin method for the time-dependent complex Schrödinger equation.*

12.30-13.00 Jaime E. Muñoz-Rivera, Reinhard Racke, Mauricio Sepúlveda: *On exponential stability for thermoelastic plates – a comparison of different models.*

13.00-15.00 LUNCH

[*Chairman*: N. HEUER]

15.00-15.45 Steffen Börm, Jens M. Melenk: *Directional $\mathcal{H}^2$-matrices for Helmholtz integral operators.*

15.45-16.15 Carlos Pérez Arancibia, Catalin Turc: *A high-order singularity subtraction method for the Nyström discretization of boundary integral equations.*

16.15-16.45 Mario Álvarez, Gabriel N. Gatica, Ricardo Ruiz-Baier: *A posteriori error analysis of a fully-mixed formulation for the Brinkman-Darcy problem.*

16.45-17.15 COFFEE BREAK

17.15-17.30 Gabriel N. Gatica, Mauricio Munar, Filánder Sequeira: *A mixed virtual element method for the Navier-Stokes equations.*

17.30-18.00 Roberto C. Cabrales, Francisco Guillén-González, Juan Jaime, Nelson O. Moraga: *A finite volume method for 3D convective solidification.*

18.00-18.30 Paul Escapil-Inchauspé, Carlos Jerez-Hanckes: *Wave diffraction by random surfaces: Uncertainty quantification via sparse tensor boundary elements.*

18.30-19.00 Eligio Colmenares, Gabriel N. Gatica, Ricardo Oyarzúa: *A posteriori error analyses for augmented mixed formulations of the Boussinesq model.*

19.00 CLOSING WORDS.