
I A B E M 2 0 1 3
SYMPOSIUM OF THE
INTERNATIONAL ASSOCIATION FOR
BOUNDARY ELEMENT METHODS

Pontificia Universidad Católica de Chile
Santiago, Chile, January 9 – 11, 2013

PROGRAM

Contents

| | | |
|----------|--|----------|
| 1 | INTRODUCTION | 1 |
| 2 | CAMPUS MAP | 2 |
| 3 | PROGRAM OVERVIEW | 3 |
| 4 | WEDNESDAY, JANUARY 9 | 4 |
| 5 | THURSDAY, JANUARY 10 | 5 |
| | 5.1 YOUNG RESEARCHERS' SESSION | 6 |
| | 5.2 SPECIAL SESSION IN HONOR OF ERNST P. STEPHAN | 6 |
| 6 | FRIDAY, JANUARY 11 | 7 |

1 INTRODUCTION

The 2013 Symposium of the International Association for Boundary Element Methods consists of a sequence of talks of **25 minutes** (20 minutes for presentation and 5 minutes for discussion). During the second day, there is in parallel a **young researcher's session** followed by a **special session** to honor Ernst P. Stephan on the occasion of his 65th birthday.

The location of the conference is campus St. Joaquín of the Pontificia Universidad Católica de Chile, Avenida Vicuña Mackenna 4860, metro station St. Joaquín (Line 5). Please note that during the morning and evening, only **red trains** of Line 5 stop at St. Joaquín. The color of trains is marked by corresponding lights outside the trains (only when this scheme is active).

Registration, all **talks** and the **cocktail** will take place in the building *San Agustín* which is immediately to your right when entering campus through its main entrance (Avenida Vicuña Mackenna). There will be signs guiding you.

Wifi: UC_eventos, password: puc.2316

Lunch will be served everyday in the Faculty of Economics (behind the chapel on the left, seen from the main entrance), on campus. Students will guide you on the first day.

The **conference dinner** will take place in the restaurant *El Mesón Nerudiano*, Domínica 35, in Bellavista (close to the zoo). There will be buses picking you up at different hotels in Providencia at around 19:30, and returning you afterwards.

On Saturday, there is the option to participate in a **tour** to the vineyard *Viña Indómita*. It lasts from about 09:45 (start in Santiago) till 16:00 (return to Santiago). The cost is CLP 35.000 per person. Please pay when registering on Wednesday. Buses will pick you up at different hotels. More details are on the conference website.

We sincerely thank our sponsors who provided the necessary financial support to keep the registration fee low and to assign 15 studentships:

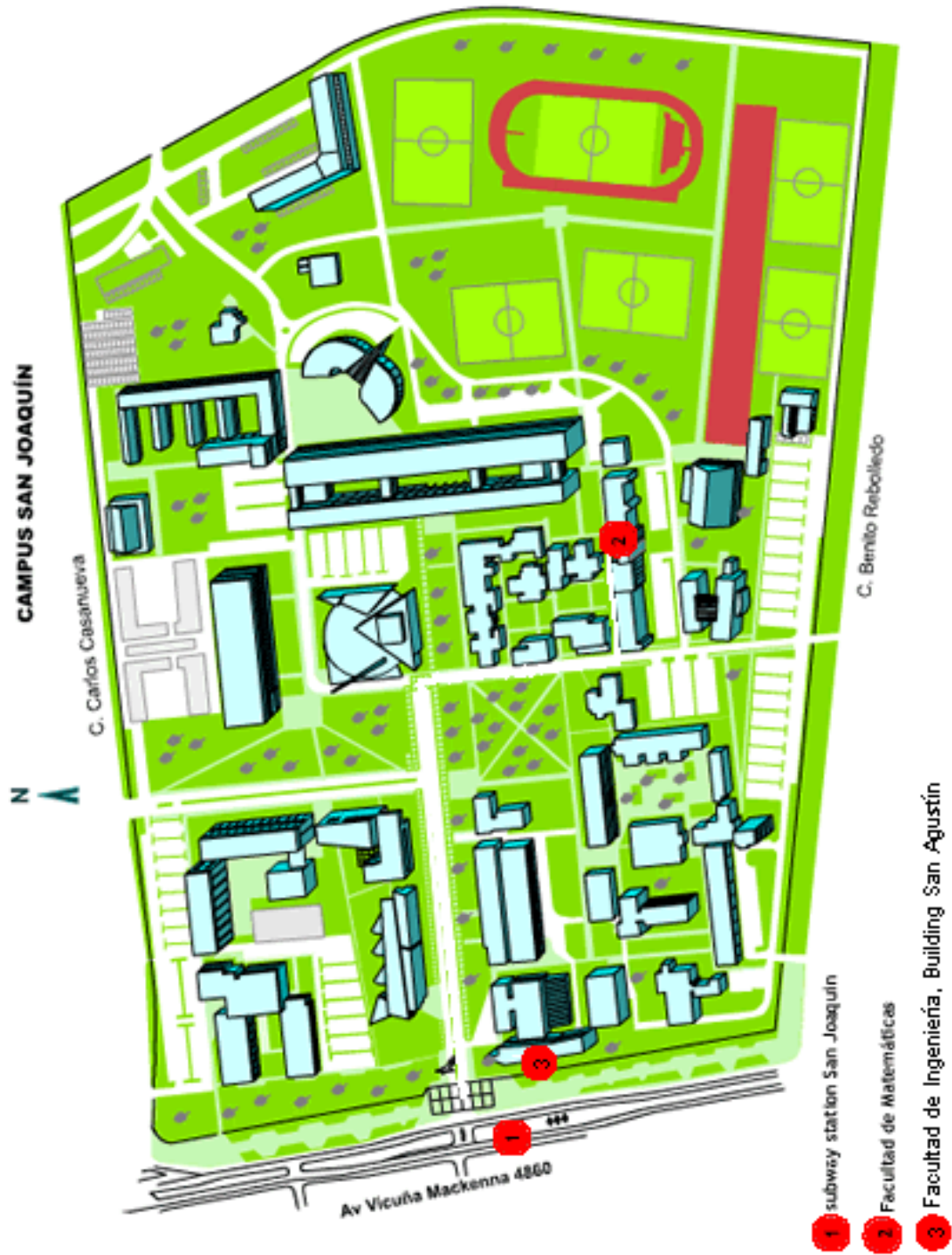
- Comisión Nacional de Investigación Científica y Tecnológica (CONICYT) through Project Anillo ACT1118,
- Nimbic,
- Vicerrectoría de Investigación, Pontificia Universidad Católica de Chile,
- Facultad de Ingeniería, Pontificia Universidad Católica de Chile, and
- Facultad de Matemáticas, Pontificia Universidad Católica de Chile.

Finally, we also thank all the participants for attending **IABEM 2013** and, in many cases, for traveling far to do so.

Norbert Heuer, Carlos Jerez-Hanckes

Santiago, Chile, January 2013

2 CAMPUS MAP



3 PROGRAM OVERVIEW

| Wednesday, January 9 | | Thursday, January 10 | | Friday, January 11 | |
|----------------------|--------------------|--|------------------------|--------------------|--------------------|
| 08:00-09:15 | registration | | | | |
| room: | Auditorio | Sala H4 | Auditorio | | Auditorio |
| 09:15-09:25 | welcome | Martin Schanz | Felipe Pinochet | 09:00-09:25 | Vikram Jandhyala |
| 09:25-09:50 | Steven Crouch | Wenjing Ye | Carolina Urzúa | 09:25-09:50 | Christopher Cooper |
| 09:50-10:15 | MingHao Zhao | Josue Labaki | Fernando Henriquez | 09:50-10:15 | Markus Bantle |
| 10:15-10:40 | Rafael Gallego | Münevver Tezer-Sezgin | Sergio Rojas | 10:15-10:40 | Mario Bebendorf |
| 10:40-11:10 | coffee break | coffee break | coffee break | 10:40-11:10 | coffee break |
| 11:10-11:35 | Ney Dumont | Pieter Coulier | Joachim Gwinner | 11:10-11:35 | Stéphanie Chaillat |
| 11:35-12:00 | Günther Of | A. I. Abreu | Francisco-Javier Sayas | 11:35-12:00 | Thomas Traub |
| 12:00-12:25 | Vladislav Mantić | Wojciech Sulisz | Michael Karkulik | 12:00-12:25 | Bernhard Kager |
| 13:00 | lunch | lunch | lunch | 13:00 | lunch |
| 14:30-14:55 | Ralf Hiptmair | Sonia Mogilevskaya | Michael Feischl | 14:30-14:55 | Helmut Harbrecht |
| 14:55-15:20 | Elke Spindler | Benjamin Marussig | Catalina Dominguez | 14:55-15:20 | Ernian Pan |
| 15:20-15:45 | Johannes Tausch | Róbert Čunderlík | Thomas Führer | 15:20-15:45 | Yijun Liu |
| 15:45-16:10 | Arno Kimeswenger | CuiYing Fan | Dirk Praetorius | | closing |
| 16:10-16:40 | coffee break | coffee break | coffee break | 15:45-16:15 | coffee break |
| 16:40-17:05 | Benjamin Stamm | Alberto Salvadori | Heiko Gimperlein | 16:15-17:15 | IABEM meeting |
| 17:05-17:30 | Mahadevan Ganesh | | Matthias Maischak | | |
| 17:30-17:55 | group photo | | Ernst P. Stephan | | |
| 18:15 | cocktail | conference dinner & F. J. Rizzo award ceremony | | | |

4 WEDNESDAY, JANUARY 9

08:00-09:15 REGISTRATION

[Auditorio, chairman: N. HEUER]

09:15-09:25 INTRODUCTION AND WELCOME BY THE VICE-RECTOR

[Auditorio, chairman: M. SCHANZ]

09:25-09:50 STEVEN L. CROUCH, JOHN A. L. NAPIER: *On the displacement discontinuity method*

09:50-10:15 MINGHAO ZHAO, CUIYING FAN, ERNIAN PAN, GUONING LIU: *Hybrid extended displacement discontinuity-fundamental solution method for two- and three-dimensional smart media*

10:15-10:40 M. A. RIVEIRO, RAFAEL GALLEGO: *BEM-AEM for 3D multi-region non-homogeneous/homogeneous elastic bodies*

10:40-11:10 COFFEE BREAK

[Auditorio, chairman: E. DARRIGRAND]

11:10-11:35 NEY A. DUMONT, DANIEL HUAMÁN: *On a consistent, mixed variational boundary element formulation for strain gradient elasticity*

11:35-12:00 DOMINIC AMANN, ANDREAS BLASZCZYK, GÜNTHER OF, OLAF STEINBACH: *Boundary element methods for electrostatic field problems with floating potentials*

12:00-12:25 CHRISTOS G. PANAGIOTOPOULOS, TOMÁŠ ROUBÍČEK, VLADISLAV MANTIČ: *BEM analysis of quasistatic delamination of viscoelastic bodies with very small viscosity*

13:00 LUNCH

[Auditorio, chairman: F.-J. SAYAS]

14:30-14:55 XAVIER CLAEYS, RALF HIPTMAIR, CARLOS JEREZ-HANCKES: *Multiple traces boundary integral formulation for Helmholtz transmission problems*

14:55-15:20 E. SPINDLER, R. HIPTMAIR, X. CLAEYS: *Second-kind single trace BEM for acoustic scattering*

15:20-15:45 JOHANNES TAUSCH: *BEM for parabolic moving boundary problems*

15:45-16:10 A. KIMSWENGER, O. STEINBACH: *Some FE and BE based approaches for boundary control problems*

16:10-16:40 COFFEE BREAK

[Auditorio, chairman: E. P. STEPHAN]

16:40-17:05 JAN S. HESTHAVEN, BENJAMIN STAMM, SHUN ZHANG: *Certified reduced basis method for the electric field integral equation*

17:05-17:30 M. GANESH, J. S. HESTHAVEN, B. STAMM: *A model reduction boundary element algorithm for computational electromagnetism*

17:30 GROUP PHOTO

18:15 COCKTAIL

5 THURSDAY, JANUARY 10

[Sala H4, chairman: V. MANTIČ]

- 09:00-09:25** PENG LI, MARTIN SCHANZ: *Time domain BE formulation for partially saturated poroelasticity*
- 09:25-09:50** W. YE, J. XIAO: *On the relationship between the frequency-domain BEM and the convolution quadrature BEM*
- 09:50-10:15** JOSUE LABAKI, EUCLIDES MESQUITA, R. K. N. D. RAJAPAKSE: *Influence of depth of embedment and material configuration on the coupled rocking-transverse vibration of rigid plates*
- 10:15-10:40** M. TEZER-SEZGIN, B. PEKMEK: *Unsteady mixed convection in a porous lid-driven enclosure under a magnetic field*

10:40-11:10 COFFEE BREAK

[Sala H4, chairman: Y. LIU]

- 11:10-11:35** PIETER COULIER, STIJN FRANÇOIS, GEERT LOMBAERT, GEERT DEGRANDE: *A coupled finite element – hierarchical boundary element method based on Green’s functions for a horizontally layered half-space*
- 11:35-12:00** A. I. ABREU, A. CANELAS, W. J. MANSUR: *A boundary integral formulation based on the convolution quadrature method for transient heat conduction in functionally graded materials*
- 12:00-12:25** WOJCIECH SULISZ: *Application of boundary element method to the modelling of a wave powered plant*

13:00 LUNCH

[Sala H4, chairman: E. PAN]

- 14:30-14:55** SOFIA G. MOGILEVSKAYA, STEVEN L. CROUCH, HENRYK K. STOLARSKI: *Generalized Maxwell’s methodology for evaluating the effective properties of orthotropic composites*
- 14:55-15:20** GERNOT BEER, BENJAMIN MARUSSIG: *Iso-geometric boundary element methods for tunneling*
- 15:20-15:45** RÓBERT ČUNDERLÍK, RÓBERT ŠPIR, KAROL MIKULA: *Direct BEM for high-resolution gravity field modelling of the earth*
- 15:45-16:10** CUIYING FAN, MINGHAO ZHAO, ERNIAN PAN, GUONING LIU: *Extended boundary integral equation method for fracture analysis in magneto-electro elastic media*

16:10-16:40 COFFEE BREAK

[Sala H4, chairman: W. YE]

- 16:40-17:05** A. TEMPONI, F. VALVONA, A. SALVADORI: *Recent advances in modeling time dependent problems via boundary elements*
- 20:00-23:00** CONFERENCE DINNER, INCL. FRANK J. RIZZO AWARD CEREMONY

5.1 YOUNG RESEARCHERS' SESSION

[Auditorio, chairman: C. JEREZ-HANCKES]

- 09:00-09:25** NORBERT HEUER, FELIPE PINOCHET: *DPG method with optimal test functions for hypersingular operators in two dimensions*
- 09:25-09:50** CARLOS JEREZ-HANCKES, CAROLINA A. URZÚA TORRES: *Operator preconditioning for two-dimensional screen and fracture problems using boundary elements*
- 09:50-10:15** CARLOS JEREZ-HANCKES, FERNANDO J. HENRÍQUEZ BARRAZA: *Boundary integral formulation for the electrical response of a nerve to an extracellular stimulation*
- 10:15-10:40** RALF HIPTMAIR, CARLOS JEREZ-HANCKES, SERGIO ROJAS: *Multiple traces boundary integral formulation for Helmholtz transmission problems with screens*
- 10:40-11:10** COFFEE BREAK

5.2 SPECIAL SESSION IN HONOR OF ERNST P. STEPHAN

[Auditorio, chairman: N. HEUER]

- 11:10-11:35** JOACHIM GWINNER: *Approximation of higher order for parabolic unilateral problems using hp -BEM*
- 11:35-12:00** CONSTANTIN BACUTA, GEORGE C HSIAO, FRANCISCO-JAVIER SAYAS: *News from the single layer potential for the transient Stokes problem*
- 12:00-12:25** M. FEISCHL, T. FÜHRER, M. KARKULIK, J.M. MELENK, D. PRAETORIUS: *Novel inverse estimates for non-local operators*
- 13:00** LUNCH
- 14:30-14:55** MICHAEL FEISCHL, THOMAS FÜHRER, MICHAEL KARKULIK, DIRK PRAETORIUS: *Quasi-optimal adaptive BEM*
- 14:55-15:20** CATALINA DOMÍNGUEZ, NORBERT HEUER: *A posteriori error estimation for a hypersingular integral equation and non-conforming domain decomposition*
- 15:20-15:45** M. FEISCHL, T. FÜHRER, M. KARKULIK, J.M. MELENK, D. PRAETORIUS: *FEM-BEM couplings without stabilization*
- 15:45-16:10** MARKUS FAUSTMANN, JENS MARKUS MELENK, DIRK PRAETORIUS: *Black-box preconditioning of BEM matrices by \mathcal{H} -matrix techniques*
- 16:10-16:40** COFFEE BREAK
- 16:40-17:05** HEIKO GIMPERLEIN, MATTHIAS MAISCHAK, ERNST P. STEPHAN: *FE/BE coupling for strongly nonlinear transmission problems with friction*
- 17:05-17:30** MATTHIAS MAISCHAK: *p -BEM and hp -BEM – efficient methods for achieving high accuracy*
- 17:30-17:55** ERNST P. STEPHAN: *High order BEM for contact problems*
- 20:00-23:00** CONFERENCE DINNER, INCL. FRANK J. RIZZO AWARD CEREMONY

6 FRIDAY, JANUARY 11

[Auditorio, chairman: G. OF]

09:00-09:25 VIKRAM JANDHYALA, ARUN SATHANUR: *Enabling high-dimensional electromagnetic design on computing clouds*

09:25-09:50 CHRISTOPHER COOPER, LORENA A. BARBA: *Using fast tree methods and GPU hardware for protein electrostatics*

09:50-10:15 MARKUS BANTLE, STEFAN FUNKEN: *Data compression techniques for the p -Version of the boundary element method for the Laplace equation in two dimensions*

10:15-10:40 M. BEBENDORE, R. VENN: *Frequency-independent approximation of integral formulations of Helmholtz boundary value problems*

10:40-11:10 COFFEE BREAK

[Auditorio, chairman: J. TAUSCH]

11:10-11:35 S. CHAILLAT, M. BONNET: *Comparison of two fast multipole accelerated BEMs for 3D elastodynamic problems in semi-infinite media*

11:35-12:00 THOMAS TRAUB, MARTIN SCHANZ: *A directional fast multipole method for elastodynamics*

12:00-12:25 BERNHARD KAGER, MARTIN SCHANZ: *Sparse and \mathcal{H} -matrix representation techniques applied to indirect time-domain BEM in elastodynamics*

13:00 LUNCH

[Auditorio, chairman: M. ZHAO]

14:30-14:55 HELMUT HARBRECHT, MICHAEL PETERS: *Comparison of fast boundary element methods on parametric surfaces*

14:55-15:20 ERNIAN PAN, YANFEI ZHAO: *Improve underground mine safety using BEM analysis and LiDAR data*

15:20-15:45 YIJUN LIU, SHUO HUANG: *Fast multipole BEM for thin plate bending problems*

CLOSING

15:45-16:15 COFFEE BREAK

[Auditorio]

16:15-17:15 IABEM MEETING