

International Conference  
on  
Mathematics and Continuum Mechanics  
Programme

February 19-22, 2008, Porto, Portugal

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## Tuesday Morning

### Computational Methods for Advanced Composites (Plenary and Invited Talks, 9:00-11:30)

Organizer : Pedro Camanho (University of Porto, Portugal)

- **Plenary Lecture** (Room B032, 9:00-10:00)

*Multiscale modelling of structural composites: the development of strategies for virtual testing*

**Francisco Javier Llorca Martínez** (Polytechnic University of Madrid, Spain)

Chair : Pedro Camanho (University of Porto, Portugal)

- Coffee Break (10:00-10.30)

- **Invited Talks** (Room B032, 10:30-11:30)

– *On the prediction of failure in laminated composites*

**Silvestre Pinho** (Imperial College, UK)

– *The simulation of coupled failure mechanisms using discontinuous solid-like shell elements*

**Joris Remmers** (University of Delft, The Netherlands) (Canceled)

Chair : Pedro Camanho (University of Porto, Portugal)

### Parallel Sessions (11:30-13:00)

#### Computational Methods for Advanced Composites (Selected Contributed Talks)

- Room B032

– *Modeling desorption of polymers*

**José A. Ferreira** (University of Coimbra, Portugal)

– *Analytical investigation of the effective properties of 2D composite materials*

**Ekaterina Pesetskaya** (University of Aveiro, Portugal)

– *Homogenisation of composite materials in thermoelasticity:*

*formal mathematics and computational issues*

**J. Pinho-da-Cruz** (University of Aveiro, Portugal)

– *Numerical prediction of low-velocity impact damage resistance of composite laminates*

**Cláudio Lopes** (Delft University of Technology, The Netherlands and University of Porto, Portugal)

Chair : Pedro Camanho (University of Porto, Portugal)

#### Mathematics and the Atmospheric Sciences (Selected Contributed Talks)

- Room B034

– *Analytical treatment of critical layer filtering of mountain waves using a WKB approximation*

**Miguel A. C. Teixeira** (University of Lisbon, Portugal)

– *Turbulence parameterization in the atmospheric boundary layer*

**Pedro M. M. Soares** (University of Lisbon, Portugal)

– *Title to be announced*

**Prashant Kumar** (Indian Institut of Technology, Kanpur, India)

Chair : João Teixeira (NASA/Caltech - Jet Propulsion Laboratory, USA)

## Lunch (13:00-14:15)

## Tuesday Afternoon

### Mathematics and the Atmospheric Sciences (Plenary and Invited Talks, 14:30-17:00)

Organizer : João Teixeira (NASA/Caltech - Jet Propulsion Laboratory, USA)

- **Plenary Lecture** (Room B032, 14.30-15.30)

*Weather forecasting: It's about dynamics, it is not about statistics.*

**Kevin Judd** (University of Western Australia, Australia)

Chair : João Teixeira (NASA/Caltech - Jet Propulsion Laboratory, USA)

- Coffee Break (15.30-16:00)
- **Invited Talks** (Room B032, 16:00-17:00)

– *Mimetic methods: from global weather forecasting to CFD*

**Luca Bonaventura** (Politecnico di Milano, Italy)

– *Cloud structures and organisation*

**A. Pier Siebesma** (Royal Netherlands Meteorological Institute)

Chair : João Teixeira (NASA/Caltech - Jet Propulsion Laboratory, USA)

## Wednesday Morning

### Contact Mechanics (Plenary and Invited Talks, 9:00-11:30)

Organizer : Marius Cocou (Laboratoire de Mécanique et d'Acoustique CNRS, Marseille, France)

- **Plenary Lecture** (Room B032, 9:00-10:00)

*Stability of quasi-static paths of finite-dimensional systems with Coulomb friction and persistent contact*

**João Martins** (Instituto Superior Técnico, Portugal)

Chair : Marius Cocou (Laboratoire de Mécanique et d'Acoustique CNRS, Marseille, France)

- Coffee Break (10:00-10:30)

- **Invited Talks** (Room B032, 10:30-11:30)

- *Recent progresses in the modeling of material behavior*

**Gianpietro Del Piero** (Università di Ferrara, Italy)

- *Quasistatic frictional contact problems. Relations between the wedge problem and the rate problem*

**Lars-Erik Andersson** (Linköping University, Sweden) (Canceled)

Chair : Marius Cocou (Laboratoire de Mécanique et d'Acoustique CNRS, Marseille, France)

### Parallel Sessions (11:30-13:00)

#### Contact Mechanics (Selected Contributed Talks)

- Room B032

- *Frictional contact problems for elastic membranes and plates as a paradigm of Moreau's sweeping process*

**Patrick Ballard** (Laboratoire de Mécanique et d'Acoustique CNRS, France)

- *Numerical analysis of a dynamic piezoelectric contact problem arising in viscoelasticity*

**José R. Fernández** (Universidad de Santiago de Compostela, Spain)

- *On the contact set between an elastic plate and a rigid obstacle*

**Cédric Pozzolini** (Laboratoire de Mécanique et d'Acoustique CNRS, France)

Chair : Marius Cocou (Laboratoire de Mécanique et d'Acoustique CNRS, Marseille, France)

#### Computational Methods for Advanced Composites (Selected Contributed Talks)

- Room B034

- *Improvements on CMM calibrations*

**Manuel A.F. Vicente** (University of Coimbra, Portugal)

- *Analysis of sandwich plates by a higher-order formulation and an improved meshless method using radial basis functions*

**Carla M. C. Roque** (University of Porto, Portugal)

- *An eigenfrequency approach to characterize and optimize 1D two-material structures for axial vibration attenuation*

**Hugo Policarpo** (Instituto Superior Técnico, Portugal)

Chair : Pedro Camanho (University of Porto, Portugal)

**Lunch (13:00-14:15)**

## **Wednesday Afternoon**

### **Modelling of Industrial Processes (Plenary and Invited Talks, 14:30-17:00)**

Organizer : Luísa Silva (ENSMP, France)

- **Plenary Lecture** (Room B032, 14.30-15.30)

*Moving surfaces and interfaces calculation in material forming*

**Thierry Coupez** (CEMEF, Ecole des Mines de Paris, France)

Chair : Luísa Silva (Ecole Nationale Supérieure des Mines de Paris (ENSMP), France)

- Coffee Break (15.30-16:00)

- **Invited Talks** (Room B032, 16:00-17:00)

– *Non-local models for localization in large deformations*

**José César de Sá** (University of Porto, Portugal)

– *The fixed mesh ALE approach: basic idea and two applications*

**Ramon Codina** (CIMNE, University of Catalunya, Spain)

Chair : Luísa Silva (Ecole Nationale Supérieure des Mines de Paris (ENSMP), France)

## Thursday Morning

### Numerical Analysis of Thin Structures (Plenary and Invited Talks, 9:00-11:30)

Organizer : Lourenço Beirão da Veiga (University of Milan, Italy)

- **Plenary Lecture** (Room B032, 9:00-10:00)

*Fundamental and applicative challenges in the modeling and computations of shells*

**Dominique Chapelle** (INRIA, France)

Chair : Lourenço Beirão da Veiga (University of Milan, Italy)

- Coffee Break (10:00-10.30)

- **Invited Talks** (Room B032, 10:30-11:30)

– *A-posteriori error estimates for the Reissner-Mindlin plate problem*

**Carlo Lovadina** (University of Pavia, Italy)

– *Numerical shell eigenproblem benchmarks*

**Harri Hakula** (Helsinki University of Technology, Finland)

Chair : Lourenço Beirão da Veiga (University of Milan, Italy)

### Parallel Sessions (11:30-13:00)

#### Numerical Analysis of Thin Structures (Selected Contributed Talks)

- Room B032

– *On reliable triangular MITC shell finite elements*

**Iria Paris** (Glaizer Group, France)

– *On the approximation of shell layers using flat anisotropic elements*

**Antti H. Niemi** (Helsinki University of Technology, Finland)

– *The deformation of cylindrical shells under generalized loads using a mixed formulation*

**Luísa R. Madureira** (University of Porto, Portugal)

– *The influence of the consideration of transversal shear in boundary conditions of free support on the stress-strain condition of the plate under the impact of transversal loading*

**Zorayr R. Baghdasaryan** (Yerevan State University, Armenia)

Chair : Lourenço Beirão da Veiga (University of Milan, Italy)

#### Contact Mechanics (Selected Contributed Talks)

- Room B034

– *A problem of adhesive contact with thermal effects*

**Giovanna Bonfanti** (Università degli Studi di Brescia, Italy)

– *Residual estimators for the xfem method in contact mechanics*

**Patrick Hild** (Université de Franche-Comté, Besançon, France)

– *On the hyperbolic contact problem for a von Kármán plate*

**Igor Bock** (FEI Slovak University of Technology, Bratislava, Slovak Republic)

- *Numerical analysis of a contact problem including bone remodeling*  
**Rebeca Martínez** (Universidade de Santiago de Compostela, Spain)

Chair : Marius Cocou (Laboratoire de Mécanique et d'Acoustique CNRS, Marseille, France)

## Lunch (13:00-14:15)

## Thursday Afternoon

### Ocean Dynamics (Plenary Talk, 14:30-15:30)

Organizer : Aires dos Santos (Instituto Superior Técnico, Portugal)

- **Plenary Lecture** (Room B032, 14.30-15.30)  
*Global ocean state estimation*  
**Rui Ponte** (Atmospheric and Environmental Research, Inc, USA)  
Chair : Aires dos Santos (Instituto Superior Técnico, Portugal)
- Coffee Break (15.30-16:00)

### Miscellaneous Contributed Talks (16:00-17:00)

- Room B032
  - *Algebraic method for approximating zeros of system of polynomials*  
**Muhammed I. Syam** (United Arab Emirates University, UAE)
  - *Fully developed laminar forced convection between parallel plates for casson fluid with viscous dissipation*  
**Z. Hakimzadeh** (Islamic Azad University of Iran)
  - *On the solution of fractional linear eigenvalue problems*  
**Qasem M. Al-Mdallal** (United Arab Emirates University, UAE)
  - *Study of crack propagation behavior in the integrally stiffened panel and conventional stiffened panel*  
**Muhammad Adeel** (Beihang University, Beijing, China)

Chair : To be announced

### Conference Dinner (19:00-22:00)

## Friday Morning

### Ocean Dynamics (Invited Talks, 10:30-12:30)

Organizer : Aires dos Santos (Instituto Superior Técnico, Portugal)

- Coffee Break (10:00-10:30)
- **Invited Talks** (Room B032, 10.30-12:30)
  - *Operational oceanography: zoom-in modeling for local applications*  
**Emanuel Ferreira Coelho** (University of Southern Mississippi, USA)
  - *Towards an hydrodynamic and biogeochemical operational model of the Portuguese coast*  
**Paulo Chambel Leitão** (Hidromod, Modelação em Engenharia, Lda, Portugal)
  - *Processes over submarine canyons*  
**Henrique Coelho** (Hidromod, Modelação em Engenharia, Lda, Portugal)
  - *Wind and ocean induced wake instabilities leeward of a deep-sea island*  
**Rui Caldeira** (Universidade da Madeira, Portugal)

Chair : Aires dos Santos (Instituto Superior Técnico, Portugal)