



ALERT GEOMATERIALS

The Alliance of Laboratories in Europe for Research and Technology
<http://alertgeomaterials.eu/>

25th ALERT Workshop and School

Aussois, 29th September to 4th October 2014

Draft Programm

(20th June, 2014)



25th ALERT Workshop Program Aussois, 29th September 2014

Session I: Constitutive modelling: what's new?

Coordinators: Claudio di Prisco, Roberto Nova (Politecnico di Milano)

- 8:30 - 8:40** **Opening of the 25th ALERT Workshop**
Manuel Pastor (Universidad Politécnica de Madrid, Spain), President of ALERT
- 8:40 - 8:40** **Morning Session Opening**
Claudio di Prisco¹, Roberto Nova¹ (¹Politecnico di Milano, Italy)
- 8:40 - 9:10** NHL-DEM, a Numerically Homogenized Constitutive Law that works in FEM-DEM multi-scale computations
Jacques Desrues (Laboratoire 3SR, France)
- 9:10 - 9:40** Microstructural interpretation of instabilities in granular media
Francois Nicot (Irstea, France)
- 9:40 - 10:10** Critical state soil mechanics: sands, clays and their fabric
Yannis Dafalias (NTUA, Greece/University of California Davis, USA)
- 10:10 - 10:40** Modelling of granular materials from solid to fluid-like flow regimes
Claudio di Prisco (Politecnico di Milano, Italy)
- 10:40 - 11:10** **COFFEE BREAK**
- 11:10 - 11:40** Soils in space: critical states, breaking particles and roots
David Muir Wood (University of Dundee, UK)
- 11:40 - 12:10** Cyclic soil modelling for Geotechnical Earthquake Engineering
George Bouckovalas (NTUA, Greece)
- 12:10 - 14:30** **LUNCH**
- 14:30 - 15:00** Barodesy – a new perspective of hypoplasticity
Dimitrios Kolymbas (University of Innsbruck, Austria)
- 15:00 - 15:30** New challenges and perspectives in modelling the unsaturated soil behaviour
Eduardo Alonso (UPC, Spain)

15:30 - 16:00 Physico-chemical couplings at intergranular contacts: recent findings and what they may mean to macro-scale geomechanics
Tomasz Hueckel (Duke University, USA)

16:00 - 16:30 **COFFEE BREAK**

16:30 - 17:00 Multiphysical couplings and stability in Geomechanics
Jean Sulem (ENPC, France)

17:00 - 17:30 Breakage mechanics for crushable geomaterials
Itai Einav (University of Sydney, Australia)

17:30 - 18:00 **ALERT General Assembly**

18:00 - 20:00 **Poster Session (intermediate level) and aperitif**

20:00 **DINNER**



25th ALERT Workshop Program Aussois, 30th September 2014

Session II: Railway Geomechanics

Coordinators: Antonis Zervos (University of Southampton), Farhang Radjai (Université Montpellier 2)

8:30 - 8:40 Morning Session Opening

Antonis Zervos¹, Farhang Radjai² (¹University of Southampton, UK ;
²Université Montpellier 2, France)

8:40 - 9:05

The use of under sleeper pads to improve the performance of ballasted railway track at switches and crossings: A case study
Louis Le Pen¹, Taufan Abadi¹, Andrew Hudson¹, Antonis Zervos¹, William Powrie¹ (¹University of Southampton, UK)

9:05 - 9:30

The effect of geometrical disposition of impermeable membranes on the subgrade service life of rail track embankments
Matteo O. Ciantia¹, Joaquín Pérez-Romero², Jean Vaunat¹ and Marcos Arroyo¹ (¹UPC Barcelona, Spain ; ²Universidad de Malaga, Spain)

9:30 - 9:55

Numerical analysis of a reinforced backfill under dynamic loading
Jean-Baptiste Payeur¹, A. Corfdir¹ and E. Bourgeois² (¹Ecole des Ponts ParisTech, France ; ² Université Paris-Est, IFSTTAR)

9:55 - 10:35

Keynote Lecture:

Ballast mechanics

Gilles Saussine (SNCF - Engineering department, France)

10:35 - 11:05

COFFEE BREAK

11:05 - 11:30

A simplified procedure for the settlement analysis of ballasted tracks
Gabriele Della Vecchia¹, Federico Pisanò¹, Andrea Galli¹ and Claudio di Prisco¹ (¹Politecnico di Milano, Italy)

11:30 - 11:55

Reinforcement of railway ballast with random fibre inclusions
Olufemi Ajayi¹, Louis Le Pen¹, Antonis Zervos¹ and William Powrie¹
(¹University of Southampton, UK)

11:55 - 12:20 Ballast settlement: mechanisms and variability
Juan Carlos Quezada¹, Gilles Saussine², Pierre Breul³ and Farhang Radjai⁴ (¹SNCF - Engineering department, France ; ²SNCF - Research and Innovation department, France ; ³Pascal Institute – University of Clermont II, France ; ⁴LMGC - University of Montpellier 2, France)

12:20 - 14:30 LUNCH

15:00 - 17:00 ALERT Board of Directors

17:30 - 18:30 ALERT PhD Prize 2014

18:30 - 19:30 ALERT Special Lecture 2014
Geomaterials under extremes
Itai Einav (University of Sydney, Australia)

20:00 BANQUETT



25th ALERT Workshop Program Aussois, 1st October 2014

Session III: Multiphysics coupling

Coordinators: Robert Charlier (Université de Liège) , Lorenzo Sanavia (University of Padua), Jean Vaunat (UPC Barcelona)

8:30 - 8:40 Morning Session Opening

Robert Charlier¹, Lorenzo Sanavia², Jean Vaunat³ (¹Université de Liège, Belgium ; ²University of Padua, Italy ; ³ UPC Barcelona, Spain)

8:40 - 9:05 Numerical analysis of reactive flow and wormhole formation in chalk
Polyneikis Stroggylis¹, Euripides Papamichos¹, Nicolas Charalambakis¹
(¹Aristotle University of Thessaloniki, Greece)

9:05 - 9:30 Hydromechanical behaviour of interfaces in the framework of nuclear waste disposal
Anne-Catherine Dieudonné¹, Fatemeh Salehnia¹, Xiang-Ling Li¹, Robert Charlier¹ (¹University of Liege)

9:30 - 9:55 A phase field modeling approach to unsaturated poromechanics
Giulio Sciarra (University of Rome La Sapienza, Italy)

9:55 - 10:20 Unsaturated collapsible soils : Mechanical analysis of water-driven deterioration
Giuseppe Buscanera¹, Costance Mihalache¹ (¹Northwestern University, USA)

10:20 - 10:45 **COFFEE BREAK**

10:45 - 11:35 Keynot Lecture:

Advances in modelling two-phase flow in porous media: theory, experiments and simulations
Majid S. Hassanizadeh (Utrecht University, The Netherlands)

11:35 - 12:00 Finite element analysis of non-isothermal multiphase porous media in dynamics, with application to strain localization application
Lorenzo Sanavia¹, Duc Toan Cao¹, Maria Lazari¹ (¹University of Padua, Italy)

12:00 - 14:30 **LUNCH**

- 14:30 - 14:55** The flow of saturated geomaterials simulated with a DEM-fluid coupling
Donia Marzougui¹, Bruno Chareyre¹, Julien Chauchat¹ (¹Laboratoire 3SR Grenoble, France)
- 14:55 - 15:20** Hydromechanical coupling in a FE² method – micromechanical influences on macroscale coupled behaviour
Bram van den Eijnden¹, Carlos Plúa², Pierre Bésuelle¹, René Chambon¹, Frédéric Collin³ (¹Laboratoire 3SR Grenoble, France; ²Andra, France; ³ Université de Liège, Belgium)
- 15:20 - 15:45** Multiphysical characterization of lime treated sand-bentonite mixtures
Hashemi Mir Amid, Bertrand François, Thierry J. Massart¹ (¹Université Libre de Bruxelles, Belgium)
- 15:45 - 16:15** **COFFEE BREAK**
- 16:15 - 16:40** Multiphysics coupling induced by artificial ground freezing in a granular material
Francesca Casini¹, Antonio Gens², Giulia M.B. Viggiani¹, Sebastia Olivella² (¹Università di Roma Tor Vergata, Italy ; ²UPC Barcelona, Spain)
- 16:40 - 17:05** Stationary and dynamic permeability and coupling coefficient measurements in sintered porous glass bead systems
Ibrahim Gueven¹, Stefan Luding¹, Holger Steeb¹ (¹Ruhr-University of Bochum, Germany)
- 17:05 - 17:30** Granular Matter at High Water Saturation Levels
Konstantin Melnikov¹, Roman Mani¹, Falk Wittel¹, Hans J. Herrmann¹ (¹ETH Zürich, Switzerland)



25th ALERT Doctoral School
Aussois, 2nd October 2014

Stochastic Analysis and Inverse Modelling

Coordinators:

Michael A. Hicks (Delft University of Technology, The Netherlands)

Cristina Jommi (Delft University of Technology, The Netherlands)

8:30 - 9:00 Introduction to the Course

Michael A. Hicks, Cristina Jommi (Delft University of Technology, The Netherlands)

9:00 - 10:30 Review of Probability Theory (1/2)

Gordon A. Fenton (Dalhousie University, Canada)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:30 Review of Probability Theory (2/2)

Gordon A. Fenton (Dalhousie University, Canada)

12:30 - 14:00 LUNCH

14:00 - 15:30 Functions of Random Variables

Abdul-Hamid Soubra (University of Nantes, France)

15:30 - 16:00 COFFEE BREAK

16:00 - 17:30 Reliability Analysis Methods

Abdul-Hamid Soubra (University of Nantes, France)

20:00 DINNER



25th ALERT Doctoral School
Aussois, 3rd October 2014

Stochastic Analysis and Inverse Modelling

Coordinators:

Michael A. Hicks (Delft University of Technology, The Netherlands)

Cristina Jommi (Delft University of Technology, The Netherlands)

9:00 - 10:30 Modelling Spatially Varying Properties (1/2)

Gordon A. Fenton (Dalhousie University, Canada)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:30 Modelling Spatially Varying Properties (2/2)

Gordon A. Fenton (Dalhousie University, Canada)

12:30 - 14:00 LUNCH

14:00 - 16:00 Random Finite Element Method (1/2)

Michael A. Hicks (Delft University of Technology, The Netherlands)

16:00 - 16:30 COFFEE BREAK

16:30 - 17:30 Random Finite Element Method (2/2)

Michael A. Hicks (Delft University of Technology, The Netherlands)

17:30 - 18:30 Advanced Reliability Analysis Methods

Abdul-Hamid Soubra (University of Nantes, France)

20:00 DINNER



25th ALERT Doctoral School
Aussois, 4th October 2014

Stochastic Analysis and Inverse Modelling

Coordinators:

Michael A. Hicks (Delft University of Technology, The Netherlands)

Cristina Jommi (Delft University of Technology, The Netherlands)

8:30 - 10:30 Geotechnical back analysis using a maximum likelihood approach

Alberto Ledesma (UPC Barcelona, Spain)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:30 Calibration of soil constitutive laws by inverse analysis

Michele Calvello (Università di Salerno, Italy)

12:30 - 14:00 LUNCH

14:00 - 15:30 Analysing time dependent problems

Cristina Jommi (Delft University of Technology, The Netherlands)

15:30 - 16:00 COFFEE BREAK

16:00 - 16:30 Discussion

Alberto Ledesma, Michele Calvello, Cristina Jommi

16:30 - 16:45 Closure

Michael A. Hicks, Cristina Jommi (Delft University of Technology, The Netherlands)