



ALERT GEOMATERIALS

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

24th ALERT Workshop and School
Aussois, September the 29th to October the 5th 2013

Draft Program
(August 26th, 2013)



24th ALERT Workshop Program Aussois, September the 30th 2013

Session I: Geomechanics of slopes

Coordinators: Claudio di Prisco (Politecnico di Milano), Leonardo Cascini (University of Salerno)

The order of the presentations may be subject to modifications

8:30 - 8:40 Opening of the 24th ALERT Workshop

M. Pastor (Universidad Politécnica de Madrid, Spain), President of ALERT

8:40 Morning Session Opening

Claudio di Prisco¹, Leonardo Cascini² (¹Politecnico di Milano, Italy; ²University di Salerno, Italy)

8:40 - 9:10 Keynote Lecture:

From a phenomenological to a geomechanical approach to landslide risk analysis and management

Federica Cotecchia (Politecnico di Bari, Italy)

9:10 - 9:40 Keynote Lecture:

Hydromechanical hillslope processes triggering landslides

Ronaldo Borja (Stanford University, USA)

9:40 - 10:05 Back-analysis of flowslide events in underwater sandy slopes: a methodology based on stability criteria for fluid-saturated soils

Giuseppe Buscarnera¹, Costance Mihalanche¹, Andrew Whittle² (¹Northwestern University, USA; ²Massachusetts Institute of Technology, USA)

10:05 - 10:30 Interpretation of landslide mechanisms based on numerical modelling: two case histories

Piernicola Lollino¹, Federica Cotecchia² (¹Istituto di ricerca per la Protezione Idrogeologica di Bari, Italy; ²Politecnico di Bari, Italy)

10:30 - 11:00 COFFEE BREAK

11:00 - 11:25 Multi-physics modelling of the initiation of shallow landslides based on Porous Media Mechanics

Lorenzo Sanavia¹, R. Ngaradoumbe Nanhornguè¹, B.A. Schrefler¹, G. Sorbino², L. Cascini² (¹Università di Padova, Italy; ²Università di Salerno, Italy)

11:25 - 11:50 Landslide mechanisms and structural damage assessment: geotechnical perspectives

Claudia Vitone¹, Fabrizio Palmisano¹, Federica Cotecchia¹, Francesca Santaloia² (¹Politecnico di Bari, Italy; ²CNR-IRPI Bari, Italy)

- 11:50 - 12:15** Multiscale approach for predicting slope instability
François Nicot¹, Félix Darve² (¹Irstea, ETNA – Geomechanics Groupe, France; ²Grenoble INP, Université Joseph Fourier, CNRS, France)
- 12:15 – 12:40** Numerical analysis of displacement patterns during an excavation with different constitutive models
Kornelia Nitzsche¹, Ivo Herle¹ (¹Technische Universität Dresden, Germany)
- 12:40 - 14:30** **LUNCH**
- 14:30 - 14:55** A new approach for mudflow global simulation
Noémie Prime¹, Dufour Frédéric², Félix Darve² (¹Université di Liège, Belgium; ²Grenoble INP, Université Joseph Fourier, CNRS, France)
- 14:55 - 15:20** DEM modelling of the impact forces against fixed vertical obstacles due to fast-moving landslides
Francesco Calvetti¹, Ersilio Vitolo², Leonardo Cascini², Settimio Ferlisi², Claudio di Prisco¹, Emmanouil Vairaktaris³ (¹Politecnico di Milano, Italy; ²Università di Salerno, Italy; ³University of Athens, Greece)
- 15:20 - 15:55** New advances for modelling debris flows and debris avalanches
Sabatino Cuomo¹, Leonardo Cascini¹, Manuel Pastor², Giuseppe C. Castorino¹, Luca Piciullo¹ (¹Università di Salerno, Italy; ²Universidad Politécnica de Madrid, Spain)
- 16:00 - 16:30** **COFFEE BREAK**
- 16:30 - 16:55** Analysis of creep pressure in mass movements – application of analytical models to case histories
Georg Ausweger¹, Roman Marte¹, Helmut Schweiger¹ (¹Technische Universität Graz, Austria)
- 16:55 - 17:20** Discrete Element Method Combined with a Lattice-Boltzmann Fluid Model for the Simulation of Debris Flowseady
Alessandro Leonardi¹, Falk K. Wittel¹, Miller Mendoza¹, Hans J. Herrmann¹ (¹ETH Zürich – Institute for Building Materials, Switzerland)
- 17:30 - 18:00** **ALERT General Assembly**
- 18:00 - 20:00** **Poster Session (intermediate level) and aperitif**
- 20:00** **DINNER**



24th ALERT Workshop Program Aussois, October the 1st 2013

Session II: Contact problems in geomechanics

Coordinators: Euripides Papamichos (Aristotle University of Thessaloniki), Jean Sulem (CERMES, Paris Tech)

8:30 - 8:40 Morning Session Opening

Euripides Papamichos¹, Jean Sulem² (¹Aristotle University of Thessaloniki, Greece; ²CERMES, Paris Tech, France)

8:40 - 9:25 Some basic contact problems in rock mechanics

Maria Stavropoulou¹, George Xiroudaki², George Exadaktylos² (¹University of Athens, Greece; ²Technical University of Crete, Greece)

9:25 - 9:50 Experimental study of sand/steel interface with application to friction law

Alain Corfdir¹, Jean Schmittbuhl² (¹Université Paris Est, ENPC CNRS, France; ²Université de Strasbourg/CNRS, France)

9:50 - 10:15 Experimental and numerical study of nail-rock interaction by pullout tests

Andreas Nicolas Berntsen¹, Euripides Papamichos² (¹Norwegian University of Science and Technology/ SINTEF Petroleum Research, Norway; ²Aristotle University of Thessaloniki, Greece/ SINTEF Petroleum Research, Norway)

10:15 - 10:40 COFFEE BREAK

10:40 - 11:25 Keynote Lecture:

Micro-Indentation of an argillaceous limestone with a heterogeneous fabric

A.P.S. Selvadurai (McGill University, Canada)

11:25 - 11:50 Inconsistencies of contact force models and impossible elasticity of 3D granular materials

Bruno Chareyre (Grenoble INP, Université Joseph Fourier, CNRS, France)

11:50 - 12:15 Role of interfaces in the analysis for aggregate size effects on mechanical strength of cement-based materials

C.F. Jin, Q.C. He, Q.Z. Zhu, J.F. Shao

12:30 - 14:30 LUNCH

15:00 – 17:00 ALERT Board of Directors

17:30 – 18:30 ALERT PhD Prize 2013

18:30 – 19:30 ALERT Special Lecture 2013

20:00 BANQUET



24th ALERT Workshop Program Aussois, October the 2nd 2013

Session III: Degradation in geomaterials

Coordinators: *Erich Bauer (Technische Universität Graz), Ali Daouadji (Université de Lorraine) and Christophe Dano (École Centrale de Nantes)*

8:20 - 8:30 Morning Session Opening

Erich Bauer¹, Ali Daouadji², Christophe Dano³ (¹Technische Universität Graz, Austria; ²Université de Lorraine, France; ³École Centrale de Nantes, France)

8:30 - 9:30 Keynote Lecture:

Particle crushing, scale effects and delayed behaviour of rockfill. A DEM investigation

E. Alonso (UPC Barcelona, Spain)

9:30 - 9:50 Numerical computations of chemo-mechanical coupling for CO₂ geological storage

K. Wojtacki¹, J. Lewandowska¹, P. Gouze², A. Lipkowski³ (¹Université Montpellier 2, France; ²Géosciences Montpellier, CNRS, France; ³Gdańsk University of Technology, Poland)

9:50 - 10:10 Chemo-mechanical weathering of calcarenites: an experimental, theoretical and numerical study

M.O. Cianta¹, R. Castellanza², C. Di Prisco³, T. Hueckel⁴, J. Fernandez⁵, C. Tamagnini⁶ (¹UPC Barcelona, Spain; ²Università degli Studi di Milano, Italy; ³Politecnico di Milano, Italy; ⁴Duke University, USA; ⁵Instituto Geológico y Minero de España, Spain; ⁶Università di Perugia, Italy)

10:10 - 10:30 The solid hardness - a key parameter for modelling the time dependent process of degradation of the grain stiffness of weathered and moisture sensitive coarse-grained soils and rockfills

E. Bauer (Technische Universität Graz, Austria)

10:30 - 10:50 COFFEE BREAK

10:50 - 11:10 Grain crushing in polydisperse granular media: focus on the cushioning effect

C. Voivret (SNCF Innovation & Recherche, France)

11:10 - 11:30 Soil-pile interface constitutive model for granular materials considering grain breakage in finite deformations

L. Berenguer-Todo-Bom¹, A. Modaressi¹ (¹École Centrale Paris, France)

11:30 - 11:50 A hypoplastic model for sand with particle crushing effect

W. Huang (Hohai University, China)

- 11:50 - 12:10** Failure of brittle materials: discrete element and finite element approaches
G. Koval¹, B.D. Le¹, C. Chazallon¹, A. Daouadji² (¹National Institute of Applied Sciences of Strasbourg, France; ²Université de Lorraine, France)
- 12:10 - 14:00** **LUNCH**
- 14:00 - 14:20** Pressure dependent hyperelasticity coupled with damage: effect of damage / modelling assumptions on elastic moduli degradation
S. Le Pense¹, A. Pouya¹, B. Gatmiri² (¹Université Paris-Est, Laboratoire Navier (CNRS, ENPC, IFSTTAR), France; ²University of Tehran, Iran)
- 14:20 - 14:40** Coupling between damage and swelling in the callovo-oxfordian claystone
P. Delage¹, M. Mohajerani¹, H. Menaceur¹, N. Conil² (¹École des ponts ParisTech, France; ²ANDRA, Châtenay-Malabry, France)
- 14:40 - 15:00** Failure of quasi-brittle materials modelled at the mesoscale: experimental and numerical analysis of the correlation during the damage process
V. Lefort¹, G. Pijaudier-Cabot¹, D. Grégoire¹, P. Grassl¹, L. Rojas Solano¹ (¹Université de Pau et des Pays de l'Adour, France; ²University of Glasgow, UK)
- 15:00 - 15:20** Modeling rock permeability and retention properties during crack opening and closure
J.-M. Pereira¹, C. Arson² (¹Laboratoire Navier – CERMES; France; ²Georgia Institute of Technology, Atlanta, USA)
- 15:20 - 15:40** Cohesive granular materials with non convex particles: application to UO₂ powder compaction
B. Saint-Cyr¹, F. Radjai¹, J.Y. Delenne², P. Sornay³, E. Azema¹ (¹Université Montpellier2/LMGC, France; ²AINRA-CIRAD-Montpellier, France; ³CEA/DEN/SPUA/LCU – Cadarache, France)
- 15:40 - 16:10** **COFFEE BREAK**
- 16:10 - 16:30** Characterization of the strain localization in a porous rock in plane strain condition using a true-triaxial apparatus
P. Lanata¹, P. Bésuelle¹ (¹Laboratoire 3SR Grenoble , France)
- 16:30 - 16:50** Identification of enriched constitutive models for geomaterials in the presence of strain localization
K. El Moustapha¹, P. Bésuelle¹, Y. Sieffert¹, R. Chambon¹ (¹ Laboratoire 3SR Grenoble , France)
- 16:50 - 17:10** Sensitivity analysis for constitutive parameters of S-clay1S model for soft clays
A.A. Lavasan¹, S. Miro¹, T. Schanz¹ (¹Ruhr-Universität Bochum, Germany)

20:00 **DINNER**



**24th ALERT Doctoral School
Aussois, October the 3rd 2013**

Soil - Structure Interaction

Coordinators:

Panagiotis Kotronis (École Centrale de Nantes)

Claudio Tamagnini (University of Perugia)

Stephane Grange (Grenoble INP, Université Joseph Fourier, CNRS)

8:30 - 8:45 Introduction: content and structure of the school

Panagiotis Kotronis, Claudio Tamagnini, Stephane Grange

8:45 - 10:30 Computational plasticity for soil-structure interaction

Ronaldo Borja (Stanford University, USA)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:30 Computational plasticity for soil-structure interaction

Ronaldo Borja (Stanford University, USA)

12:30 - 14:30 LUNCH

14:30 - 16:30 Computational soil dynamics

Claudio Tamagnini (Università di Perugia, Italy)

16:30 - 17:00 COFFEE BREAK

**17:00 - 18:00 Soil Structure Interaction under earthquake loading:
Theoretical framework**

C. Lai

20:00 DINNER



**24th ALERT Doctoral School
Aussois, October the 4th 2013**

Soil - Structure Interaction

Coordinators:

Panagiotis Kotronis (École Centrale de Nantes)

Claudio Tamagnini (University of Perugia)

Stephane Grange (Grenoble INP, Université Joseph Fourier, CNRS)

**8:45 - 9:45 Soil Structure Interaction under earthquake loading:
Theoretical framework**

C. Lai

**9:45 - 10:45 Centrifuge modeling of foundations subjected to cyclic
loading**

L. Thorel

10:45 - 11:15 COFFEE BREAK

**11:15 - 12:30 Centrifuge modeling of foundations subjected to cyclic
loading**

L. Thorel

12:15 - 14:00 LUNCH

**14:00 - 16:00 Centrifuge modeling of foundations subjected to dynamic
loading**

S. Escoffier

16:00 - 16:30 COFFEE BREAK

**16:30 - 18:30 Using strong and weak motion (ambient noise) to identify the
dynamic characteristics and the response of buildings
considering soil-structure interaction**

P. Gueguen

20:00 DINNER



**24th ALERT Doctoral School
Aussois, October the 5th 2013**

Soil - Structure Interaction

Coordinators:

Panagiotis Kotronis (École Centrale de Nantes)

Claudio Tamagnini (University of Perugia)

Stephane Grange (Grenoble INP, Université Joseph Fourier, CNRS)

8:30 - 9:30 Application of XFEM to fault rupture dynamics

Ronaldo Borja (Stanford University, USA)

9:30 - 10:30 Modeling of SSI effects on piles

Claudio Tamagnini (Università di Perugia, Italy)

10:30 - 11:00 COFFEE BREAK

11:00 - 12:30 Advanced numerical modeling of soil-structure interaction problems: peculiarities, examples and case studies

C. Lai

12:30 - 14:00 LUNCH

14:00 - 14:30 Advanced numerical modeling of soil-structure interaction problems: peculiarities, examples and case studies

C. Lai

14:30 – 15:30 Simplified modeling strategies for soil-structure interaction problems: The multifiber beam concept

Panagiotis Kotronis (École Centrale de Nantes, France)

15:30 – 16:30 Simplified modeling strategies for soil-structure interaction problems: The macroelement concept

Stephane Grange (Grenoble INP, Université Joseph Fourier, CNRS, France)

17:00 Closure of the ALERT Doctoral School 2013